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ARCHITECTURAL COMPOSITION

ARCHITECTURAL COMPOSITION

An Attempt to Order and Phrase Ideas
which hitherto have been only Felt by the
Instinctive Taste of Designers

By

JOHN BEVERLEY ROBINSON

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SECOND EDITION

ILLUSTRATED BY
EIGHTY-EIGHT HALF-TONE ENGRAVINGS AND
EIGHTY-FIVE LINE DRAWINGS

LONDON
B. T. BATSFORD, 94 HIGH HOLBORN
NEW YORK
D. VAN NOSTRAND COMPANY
1914

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THE TROW PRESS, NEW YORK

L.D. Office
Landscape des-C.
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PREFACE

A CONVICTION in the mind of the author of the possibility of formulating the approved practice of architects in designing the exterior of buildings resulted in the publication in 1898 of a series of articles upon the Principles of Architectural Composition in the *Architectural Record*, which were afterward reprinted in book form.

This was favorably received, and formed the basis of a course of lectures which has been given by the author annually for some years at Columbia University before the students of the School of Architecture.

The theories involved have never been impugned, nor indeed can they well be; as they comprise only generalizations of principles which have long been recognized in their individual application.

The present work developes these theories in more coherent and logical form, and, it is believed, will serve to simplify the acquisition of the subject of which it treats.

In conclusion, the author expresses his thanks to those whose names follow for their kind aid in obtaining illustrations: Messrs. Babb, Cook & Willard; Mr. James B. Baker; Mr. H. W. Desmond; Mr. Wilson Eyre; Messrs. Carrere & Hastings; Mr. George A. Freeman; Messrs. Howe, Hoit & Cutler; Mr. Elliott Lynch; Mr. Benjamin W. Morris; Messrs. Bruce, Price & de Silbour; Mr. George B. Post; Mr. H. W. Poor; Messrs. Andrew J. Robinson Co.; and Mr. E. R. Smith.

JOHN BEVERLEY ROBINSON.

ARCHITECTURAL DEPARTMENT,
BOARD OF EDUCATION,
NEW YORK, 1907.

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A NEW SYSTEM OF
ARCHITECTURAL COMPOSITION

I

THE STANDARD OF TASTE

THE very first obstacle that is encountered in any discussion of æsthetics is the old and still unsettled question of the standard of taste. What entitles us to say that anything is pretty or beautiful?

Many things that the untutored sense applauds, the more sophisticated apprehension decries. The music that we now most enjoy, in our earlier years seemed to have no music in it. What we then wanted was a good old tune repeated in every verse; now, both verse and tune seem repugnant and insipid.

So in architecture. Well we can remember when our taste was the barbarous taste of the ordinary civilized human being, not able to distinguish the good from the bad, nor the good from the merely pretty. Looking back, we can now recognize that the chief source of our pleasure in a building was its color, the warm yellow gray of the stone in preference to the hackneyed red of the brick. A building with arches in it, too, we preferred from the earliest years.

After all, there is an underlying accuracy in the unsophisticated æsthetic sense that cannot be ignored. The buildings that have been admired through the ages by everybody appeal not less vividly to the untaught than to the cultivated taste. What veriest Philistine failed to admire the great Campanile of Venice, now so recently vanished from earth; yet what tower was more praised by the connoisseur? Certainly where Philistine and connoisseur agree we are entitled to place our confidence.

There is, too, the ever-fluctuating fashion of the day to be taken into account. For a few years we all admired Victorian Gothic; then we branched off on the "Art nouveau" of its day, the fruitful though much-abused "Queen Anne." Then came Richardson and his imitators; then nothing would do but Italian Renaissance; until, through the road of the classical revival, merging into the "Colonial," we have brought up at the present time in the modern French style, in which, as in any other, many good and many bad things are done daily.

With all these changes we have at least gained in catholicity of taste. The time was when a sincere admirer of the revived Greek style really thought a Gothic church devoid of beauty; to-day we are at least able to put ourselves in other people's shoes and regulate our admiration by other standards than our personal preferences.

No attempt is made in the following pages to lay down any standard of taste at all, except this:

Any system of composition to be at all valid must be independent of the variations in methods that have prevailed, and must be applicable to all styles that have existed and to all that shall hereafter come to life. Such illustrations as are given are chosen intentionally from the most widely varying types, and it is assumed that designs which are generally admired in their time and place are proper objects of admiration.

It is exceedingly doubtful, however, whether our admiration of the monuments of the past is of precisely the kind it should be. A Doric temple is generally regarded by all schools as the most perfect development of architecture. So it is, indeed, but it is very doubtful whether it is the most beautiful. On grounds of pure beauty either the Japanese temple or the Gothic temple would probably outrank it; but it must be remembered that to the Greek, as to ourselves, "mere prettiness" was not all. Besides the criterion of beauty, the Greek regarded *το πρέπον*, the proper, or the suitable, as indispensable.

The triglyphs, for instance, always seem out of place to the unaccustomed critic, and that they seemed so to the delicate Greek apprehension is evidenced by the fact that in the later styles, the Ionic and Corinthian, they were left out, and the frieze was made continuous.

All such questions are left untouched. It is assumed that if the triglyphs were good enough for the Greeks to use, they are good enough for us to regard them as a proper adjunct of a carefully considered composition.

There are two ways of presenting a subject in writing: the first—the analytical way—by collecting all the facts, laying them before the reader and suggesting the conclusions to which they point. The other, the synthetical way, is to place the facts as illustrations, after stating the general principle that has been reached by analysis.

The first way is the true scientific method; its only drawback is that it is intolerably tedious. Neither is it in accordance with the natural working of the mind. Thought, to exist at all, must classify ideas as they come. Some basis of classification must previously be found, however temporary and incomplete, before thought can work at all.

The second method therefore is the one that has been adopted. Generalizations that have been reached slowly by the multiplication of examples are first stated as elementary principles and then illustrated by examples more or less numerous.

This method involves a certain arbitrary tone in statements, which is unavoidable, yet the farthest possible from the attitude which is intended. With every seemingly bald assertion there is an implied appeal to the knowledge of the subject which exists in the reader beforehand, and the implied question: " If you do not think the facts point to this generalization, to what other generalization do you think they point?"

In fact, it is primarily to the professional designer in an office, or to the would-be designer in office or school, that this book is addressed.

Every draughtsman who develops into a designer advances by absorbing certain methods, scarcely conscious that he has done so; using one motive for all of his designs until another is added to his repertory, and so on, gaining a critical sense with each step of growth, but growing as the plant grows, without introspection or reflection, without any intellectual realization of the processes of his æsthetic apprehension.

Such a measure of skill as intuitive apprehension can give is properly called an art; with reflection and generalization added it becomes a science, more or less perfect. If any designer will join with his condemnation or approval of any composition the question, Why is this pleasing, or, Why is that unpleasing, and make, in reply, some general statement of his reasons, he may arrive at all the conclusions herein reached, though he will very possibly use other words to describe them.

The object of this work is to excite thought, and to register the results of the author's own observations, with the view of raising the power to design from its comparatively obscure position as an art to the dignity of a science.

Hitherto the designers of engineering works have boasted that they were guided by pure science, and have scorned even an attempt to make their productions pleasing to the eye; but for the future it will be possible for the student of engineering to give the same sort of intellectual consideration to the appearance of his work that he now gives to its stability.

One more reservation must be borne in mind. Among the various qualities that are needed for a perfect result in architecture it is rarely possible that all can be completely reached in a single design.

The requirements and conditions of use are so exacting that after satisfying one æsthetic condition we are often obliged to dismiss others with scarcely an attempt to meet them, with full realization of the solecisms that we are forced to commit, although a skilful designer often can make the presence of one quality atone for the absence of others, concealing unavoidable disproportion of certain parts by accentuation of others, or modifying an unmanageable plan to the advantage of its convenience in use, as well as of its availability as the basis of his composition.

II

WHAT IS ARCHITECTURE?

IN the popular mind, outside of the larger cities and the more cultivated circles, there is but little difference between an architect and a builder. The writer, who deems himself worthy to be ranked among the former, has more than once been introduced to rustic committees as "the carpenter," nor is a much higher ideal prevalent even among the more sophisticated.

At the best the architect is conceived as a builder who has mastered the mysteries of "style." That the mechanical adaptation and construction of the building should be perfect and the "style" an accurate reproduction of the details of some historical or contemporary type is the highest possible commendation.

Even among architects themselves there is scarcely any broader conception. "Architecture is decorated construction"; "Architecture is dependent on construction and should express the construction"; "Architecture is suitable arrangements to meet certain wants."

Planning, materials, construction may all be studied and generalized, but, when it comes to the real architecture, the composition of the exterior, the only rule at present is, "Go out and find something that is the fashion and make your building like it." Now all these ideas and precepts have a certain truth. Architecture certainly implies building, and as far as getting buildings built is a necessary condition, an architect is to that extent a builder. Yet that there is more to architecture than mere building, we all feel intuitively; perhaps he comes nearest to it who says: " I know what kind of a building I want myself, but I must have an architect to make the outside of it."

In the same way architecture implies construction, and it is impossible to divorce the architectural result from the construction entirely even if it were desirable; but that the exhibition of the construction is a necessary characteristic of good architecture cannot be maintained.

Thus if we are obliged, or prefer, to span an opening with a lintel, it is sometimes permissible, or even essential, to cut the lintel into imitation voussoirs of a flat arch. It is true that the best designers try to avoid such expedients, but avoidance is preferable—not because deception is morally wrong, for deception to give pleasure is not felt to be morally wrong, as in the case of the beer mugs filled with jelly and crowned with meringue instead of foam, which are sold in the streets—but because of a certain sense of unreality, of mere theatrical pretense, which detracts from the full enjoyment of a design in which such pretenses are too frequent or too evident, however beautiful it may otherwise appear.

Nor, again, will the frequent theory that decoration must not be constructed always hold good, as we admit when we find the culminating glories of the two great historical styles, the colonnade of the Greek, the spire of the Gothic, both of them constructed decoration, not to speak of many of the minor parts that were no less so.

Neither is the material of construction a fundamental consideration, except in so far as it forces its consideration upon us. If it were possible, for instance, to carve a marble figure with the attenuated parts that it is possible to use in bronze there would be no objection to doing so, nor would there be any artistic objection to executing an iron grille in wood, except that the practical error would soon correct itself by the rapid destruction of the frail wooden frame.

Nor, conversely, is there any objection to imitating a marble figure in bronze, which is perfectly practicable, save that thereby we lose both the special beauties of which bronze is capable, and at the same time the special charm of the stone in its own appropriate place.

To gain a sufficient notion of the proper extent to which the material must be considered, observe and talk with a woman of taste engaged in designing a costume from a fashion plate. Note that the extraordinary contorted fashion plates are to the feminine mind merely diagrammatic, not intended to really represent a clothed human figure, but only so much stuff, with so many yards of trimming, cut to attain a certain result, which is always accentuated by exaggeration. This costume, she will explain, must be executed in a material somewhat like that shown. A solid color would not do without more trimming; this design is made plain because it is of richly figured brocade. Besides this, it must be of a certain weight; a light summer silk, however suitable in color and figured ornament, could never interpret those heavy folds properly.

So in architecture, there is no valid reason why a building executed in cement should not deserve our praise as much as if it were of Parian marble, except that delicacy of arris and the brilliancy that results from undercutting are unattainable in cement, and on the other hand certain characteristic effects may better be obtained in it by forsaking the imitation of stone and adopting a new treatment suited to its peculiar qualities.

Apart from such necessary considerations, an architectural object is to be regulated by the same rules and criticised by the same formulas, whether built of granite or stucco or sugar paste. It is not worth while to combat more seriously such incidental truths and partial statements of facts that have been allowed to obscure an intelligent theory of the scope and full meaning of the word architecture.

It is universally admitted that architecture is a fine art, that is to say, like other fine arts, something more than a mechanical art. To say that sculpture was the art of mixing clay and shaping it would be quite inadequate. So it would be inadequate to define painting as the art of applying pigments to surfaces. The first might suffice to define a brickmaker or a potter, the second to define a house painter, for these are both mechanical arts, but a fine art is something more than this: it is a mechanical art with the added qualification that the objects produced by it must give pleasure.

This it is that constitutes an art a fine art: its pleasure-giving quality independently of its useful qualities. A mechanical art is one which fashions objects primarily intended for use; a fine art that which is primarily intended to give pleasure.

Of the recognized fine arts there are three that are representative, either entirely or chiefly: literature, painting, and sculpture. These give pleasure chiefly by the pleasurable representations they depict, although the pleasure that attaches to the material form is also essential to each in differing degrees. Thus prose literature and poetry give pleasure partly by that which they describe, partly by the agreeable arrangement of sounds, partly by the sentiment that accompanies them.

In the same way painting and sculpture produce pleasure by appealing to various senses and sentiments. These are therefore to be classified by themselves as representative arts in contradistinction to those remaining and now to be enumerated.

The fine arts distinguished as pure, as opposed to representative, are architecture and music. The office of the latter is to arrange sounds that shall be agreeable to the ear; that of the former is to shape material objects so that they shall please the eye.

It is true that certain sentiments are aroused by certain kinds both of music and of architecture: we speak of both as grand or dignified or playful or exuberant; nevertheless, apart from the question, and a very curious one it is, of why certain sounds produce certain emotions, it is indisputable that the only means wherewith music can produce its result is sound—absolutely nothing else.

So also architecture, apart from the figures, scenes and suggestive ornaments that may be placed upon objects produced by it, has its own function in fashioning material forms into agreeable shapes, not incompatible with, but not necessarily limited by, their useful applications.

As music is the art of sound, so architecture is the art of form. Not representative form, not garlands and metopes and inhabited niches, but walls and roofs and columns, and not only these, but objects not properly buildings at all—pedestals and tripods and monuments.

Closely connected with architecture, forming, in fact, almost a part of it on a smaller scale, is the fictile art which shapes vases, urns, and such minor objects, which may indeed be put to some use, but which are intended primarily to be looked at simply for the pleasure that their shape or color, or both combined, give.

Another pure art, also classed as a fine art, though not esteemed equal in dignity to architecture and music (it has at times been ranked alongside of music), is the art of pleasurable motion, the dance.

There should be indeed a fourth pure art, the art of nonrepresentative color, bearing the same relation to painting that architecture does to sculpture, but this has not yet been separately catalogued and is usually merged in the sister art of form.

This distinction between pure art and representative art is the reason why it is possible to lay down rules for the former, but not for the latter, as these are too complicated in their appeals to the emotions for any but the most approximate rules, derived from those for the corresponding pure arts, and applicable to representative art only in so far as the latter must include a certain proportion of pure art. So the catalogue of fine arts will stand thus:

PURE ARTS

1. The Art of Form Comprising all fictile art that is not representative of life, and including the art of decorative color.	Architecture.
2. The Art of Sound	Music.
3. The Art of Motion	Dancing.

REPRESENTATIVE ARTS

1. The Art of Representative Form	Sculpture.
2. The Art of Representative Color	Painting.
3. The Art of Representative Sound Including both prose and poetry, of which the former is almost entirely representative, laying little stress on the beauty of expression, while in the latter the importance of the expression is paramount.	Literature.

These are, of course, involved and intertwined in the most complicated manner, each one infringing on the province of the other in a way which suggests an intimate connection among them.

Thus Song is a combination of Music and Literature; Music and the Dance are inseparable; while Architecture associates with itself the applied arts, so to speak, of Sculpture and Painting.

Nevertheless, the classification which we have made is a real distinction and useful in clarifying our ideas upon the subject.

We must therefore think of true architecture, not as the development of economical planning, not as the expression of construction, not as adherence to historic or contemporary precedent, but as the fundamental art of inventing and constructing objects that please by their intrinsic form and color, addressing itself to buildings in the largest sense of the word, whether inhabited or built only to be looked at, as triumphal arches, mausoleums, domes, towers, and spires.

It is the combination of the requirements that usually architectural objects must be both habitable and also pleasing to look at that causes many of the difficulties of architecture in practice.

The considerations that we have advanced will sufficiently justify the use of conventional ornament in architecture and refute the position so strongly taken by Ruskin, that the only proper ornament is that which represents some natural object.

So far from using natural forms for architectural decoration, the Greeks, who are still our masters in such things, achieved their greatest successes in their studies of pure form in ornament. Their wonderful anthemion device, their still unsurpassed egg-and-dart invention—I say invention advisedly, in spite of its undoubted historical development from the lotus, as shown by Goodyear's investigations—their equally wonderful Ionic and Corinthian capitals—all of these are not, and are not meant to be, either representative or even suggestive of vegetable form, any more than the profile of one of their vases is derived from or meant to suggest a crook-necked squash. On the contrary they are studies of beautiful form in the abstract, as all architectural objects, large or small, must be, limited only by the unavoidable limitations of use and material.

The only art that stands alongside of architecture as a pure art, is music, and that there is an intimate connection between them has long been intuitively felt. It appears that the Greeks associated them closely, and it is probable that the connection lay in some mathematical method of determining the form of the parts of buildings derived from the known numerical relations of musical intervals, which caused the Greeks also to associate music and mathematics.

Just what these rules were we do not know, but it seems certain that they must have been very flexible, and very far from cut-and-dried, to judge from the liberties the Greeks took and the continual variations they employed even in fixed types.

What concerns us immediately is that, of the pure arts, music has for a long time been reduced to the more or less scientific rules of counterpoint and harmony. These rules when first outlined were far from scientific, being based upon the arbitrary distinction of chords and discords, although, from the first, flavored with a scientific tinge from the known mathematical relations of the lengths of concordant and discordant strings.

Afterwards, when the length of the string was shown to be a function of the number of vibrations, and when the coincidence of the vibrations was shown to be the fundamental cause of harmonious combinations, music was placed upon a thoroughly scientific basis.

Nevertheless, scientific though music has become, and essential as is a knowledge of the science of music to the composer, it is far from possible to write a musical composition entirely by rule; on the contrary, the composer writes by his feelings, with hardly a thought of the science of it, partly using his scientific knowledge unconsciously as a basis; partly referring to it in case of doubt; partly boldly transgressing it, when genius leads the way.

Observe, however, that a comparatively small amount of science is needed to regulate and illumine; that is to say, not a small knowledge of all known musical science, but that all known musical science is capable of accomplishing very little in manufacturing ready-made musical compositions.

It is still quite impossible to sit down and turn out compositions of any length and of all styles by rule; the musical impulse must first exist, and drive to the expression of it, an expression which is only facilitated by musical science.

Is it not possible for us to lay down such a measure of science for the other pure art, architecture? Is it not possible for us to select certain combinations that are known to be pleasing and distinguish in them the simple facts of number and size that mark them, as the first musical theorizer selected the pleasing chords and measured the strings that sang them?

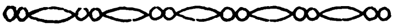
It is not to be supposed in making this comparison with music, as that one of the pure arts that first reached scientific development, that any strict deduction from one pure art to the other is intended or is possible; yet as the eye and the ear are the only two senses to which measured æsthetic pleasure is possible, the one in feet and inches, the other in bars and beats, it may be that the rules which apply to one may eventually be found to be based upon the same psychological facts as those which apply to the other, and the ground may be laid for a general theory of æsthetics which will include all the arts of representation, as these are but the pure arts of sound and form, with an element of portraiture added.

Note some interesting analogies which may mean much in future.

Why is it that in all the arts a unit composed of one large and two small parts gives pleasure?

In architecture, the bead and reel in all its varieties.

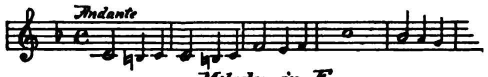
In poetry, the typical dactylic measure, the mere diagram of which looks almost like a bead and reel ornament.


Bead and Reel

— ◡◡ — ◡◡ — ◡◡ — ◡◡ — ◡◡

Dactylic Measure

In music such passages as this, from Rubinstein's Melody in F.



Melody in F

And in the dance, the ever favorite *deux temps*, or two-step, as it is now called.

Is it possible that such curious likenesses are destitute of meaning; or is it not probable that they point to an underlying unity of the æsthetic arts that we shall some day penetrate?

We are about to develop certain theories which may serve as a foundation for architecture, very much as the theories of harmony serve as a foundation for music.

Not that such theories will enable anyone to conceive and elaborate an architectural creation any more than the scientific theories of harmony can originate musical compositions; the best that we can do, whether in form or sound creations, is to lay down such rules as will facilitate the material expression of the conceptions of the imagination and reason:

That done, architecture will take its true place as an art founded upon science, not only in the subordinate functions of arrangement and construction, but in the fundamental function, by which alone architecture can claim rank as a fine art at all, that of making its creations beautiful.

III

UNITY

IN all works of fine art there is one fundamental quality which from antiquity has been recognized as essential. This quality is unity.

In literature this means sticking to the subject in hand, and not running off into excursions on allied topics; besides this there is unity of literary form, to which in poetry the metre so much conduces.

In music, unity lies in the persistence of a single theme throughout a composition, to which add the formal unity of key and measure.

In painting, apart from the unity of arrangement which is closely analogous to that of architecture, there is the unity of color that comes from painting every part with the same palette.

In the arts of design, including architecture, one of the chief sources of unity lies in the arrangement of parts, by which objects otherwise unrelated are so placed that the mind loses sight of them as separate objects, and notes only the combination as a single whole.

Thus a number of lines taken at random and laid in no particular order, cannot impress the mind otherwise than as a multitude of objects (*a*, Fig. 1).

Placed thus (*b*), radiating from a centre, the mind regards the combination as a single star or flower, and forgets to enumerate its parts at all.

So such forms as these (*c*) remain isolated individuals until they are combined in a honeysuckle (*d*). Another source of unity is the intrinsic power of certain forms when properly placed. Thus, in an enriched moulding the forms of the enrichment acquire unity merely by their arrangement in a straight line (*e*), just as in (*b*) unity was given by arrangement in a circle. The addition of horizontal straight lines on each side, as at (*f*), at once gives a complete union of the parts, so that an observer, if asked to describe what he saw in (*f*) would answer, a border, or an ornamental band, and not, ten ovals, eleven dashes, and two lines. This power of a straight line to give unity is constantly used in architecture in the horizontal mouldings, whether enriched or not, which are frequent in all styles.

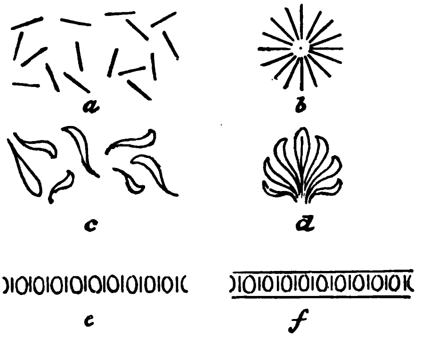


Fig. 1.
Unity produced by arrangement of parts.

So fundamental is this quality of unity that scarcely any other is needed for excellence in a work of art. If we can succeed in producing something in which no part seems to be extraneous—"stuck on," "gingerbread"—such are the colloquial criticisms—we may be confident that we have done a fairly good thing. If, in addition, every part is exactly suited to its place in shape, size, and relative dimensions the result will be not far from perfection.

Such other qualities as conduce to the beauty of the composition, such as grace, delicacy, refinement, are too elusive to be labeled and catalogued; the only criterion that we shall appeal to in the following pages is this quality of unity.

In every architectural object, whether great or small, simple or complex, whole or part, from the pyramid to the denticule, there are five aspects of its material shape that must be separately considered as related to the unity of the whole.

First, intrinsic shape; and we shall find that certain shapes must be used in certain ways to produce the effect of a single whole.

Second, relative shape, that is to say, the shape of each part in relation to other parts, whether of similarity or of contrast.

Third, relative size, one or more parts predominating and the rest subordinated by their inferior size.

Fourth, number of parts, with their size, shape, and relative position taken into consideration.

Fifth, relative dimensions of parts, or what is properly called proportion.

In the following chapters we shall take up these subjects and deal with them more fully in the order in which they are here enumerated.

IV

INDIVIDUALITY

IN all architectural compositions there are two sorts of shapes which correspond to two opposite sentiments. Not only are there two such sets of shapes, but there are also corresponding arrangements of parts in respect to number and size which arouse answering emotions.

These emotions or sentiments, using the words as expressing the same feelings in different degrees, are the sentiment which we have previously dwelt upon, that of unity, and its antithesis, by which is meant not heterogeneity or disorder, but rather the opposite of that strong sense of fixity upon a single object which constitutes unity. Shall we say then a sense of plurality? It is hardly that in all cases, as plurality relates to number only, while we shall find that a sense of individuality and its opposite attaches to shape alone as well as to number.

Indeed there is no more basic mind-principle than this, or than these, for they are counter faces of the same mental make-up that runs through all architectural, and indeed all other kinds of design.

This antithetical view might be called infinity, as opposed to individuality, but that would hardly give the true feeling. What is to be expressed is the sense of spreading out as opposed to concentration. Carried to its limit this spreading out does become infinity, but it may exist within narrower limits, and for such more frequent use needs a more descriptive name.

Let us call it then distribution or continuity, distribution more especially as applied to the number of objects, when we come to speak of that aspect of them, while continuity may serve better with respect to their shape, with which we are now concerned.

Yet we may use these words, continuity and distribution, sometimes almost interchangeably, the ideas which they are to convey being closely locked, as merely different parts of one and the same sentiment, and always tending toward the ultimate emotion of infinity.

Individuality, while closely connected with unity, is not quite identical with it. Unity may exist in a composition of which some parts are marked by individuality and others by continuity; or continuity may be the most striking characteristic of a composition, which, as a whole, possesses perfect unity. Where the composition is simple and the parts few, individuality becomes identified with unity.

The Egyptian pyramid, rising from the level ground, and with every outline trending toward a single vertex, with pyramidal and pointed forms generally have been recognized as possessing the most striking individuality.

Everywhere in literature have pointed forms figured even as sentient beings in metaphor, so strongly is this feeling of individuality inherent in their shape.

> Hast thou no voice, O Peak?

It has not been commonly recognized, but reflection will show that it is true that the only other architectural termination of a distinct character, the horizontal or square-headed type, is absolutely without individuality, and is the fullest expression of its antithesis, namely, continuity. In looking at an object with a horizontal line above, the eye ranges from side to side, nowhere finding a point of concentration, and in the absence of concentration there is no individuality.

Only in architectural composition is it necessary to say "above"; in general composition a horizontal line, or indeed a continuous line of any kind, has this same character. But in architectural composition the bottom line is always determined by the ground the building stands upon, so that the termination above is all that we have to consider.

Thus our first classification of architectural objects into pyramidal and square-headed, which seems at first glance superficial and trivial, is really basic. This will be seen more clearly if we trace its origin and consequences a little further.

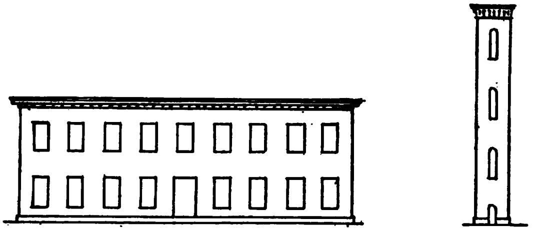
The reason why a pyramid possesses individuality is because the lines trend to a single point. Now if there is any other way of indicating a point we may find a clue to other expressions of individuality. In general composition, that is to say, decorative design on the flat, that knows neither up nor down, the most individual object is a point or a circle. But in architecture, until we come to details, such as panels, windows, carvings, and the like, which may be circular, we have not the material conditions for drawing circles and points. All of our architectural objects must stand on the ground, and our boundary lines on each side must be approximately vertical, as become stones and bricks that are piled on top of each other.

In the plan, it is true, we may have circles, and a certain weight attaches to these even when they are not seen, but only inferred, as they always must be. The view of a circular temple at a moderate distance could be perfectly rendered by a very slight convex curve in the entablature, the plan remaining a straight line, and by setting the columns more closely toward the ends of the colonnade, all of them standing in a straight line.

It might be necessary to render two or three terminal columns, where they run together, by single ones appropriately cut, but if properly done, and lighted full in front to minimize the effect of shading, a circular temple could be depicted with a flat-faced structure of stone just as well as on a flat canvas with paint and brush.

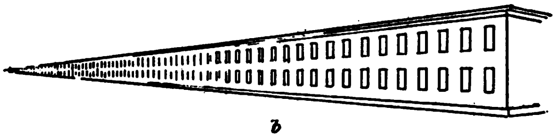
For any true æsthetic judgment of the productions of architecture we must judge them as we do a picture, ignoring considerations of utility in the plan and practicability in the material.

Now, from this point of view, if a building with a horizontal top line lacks individuality, and possesses continuity, as at Fig. 2 (*a*), tending more and more to infinity as at (*b*), the longer it is in proportion to its height, what will happen if, instead of lengthening it out to infinity, we shorten it until it becomes very narrow relatively to its height? Evidently as we narrow the base we attain more and more



a
Continuity.

c
Individuality



b
Infinity.

Fig. 2.
Unity produced by either individuality or continuity.

individuality, until at the logical limit of a perpendicular line we would reach the next thing to a point, in fact, the closest possible approximation thereto.

We thus note that the architectural object next in individuality to the pyramid and pointed shapes generally is the tower.

Now this connection of the long horizontal building with the idea of continuity, and of the tower with individuality, leads to a further generalization.

Every architectural structure is naturally composed in its vital structure of horizontal and vertical lines. Vertical, because the force of gravity requires things to be piled plumb on top of one another in order to stand at all; horizontal, because the level ground and floors, aided by the beds of the construction, whether of wood, stone, or iron, naturally so determine; so that in every structure there are both of these principles, that of individuality, centring in the perpendicular line and perpendicular mass, and that of continuity, finding its expression in the horizontal line and protracted horizontal mass.

It must not be supposed that because continuity is antithetical to individuality it is therefore antagonistic to unity. On the contrary, quite the opposite is true: continuity of line and mass, when properly used, is quite as requisite as individuality for unity, indeed may often take the place of it entirely, as in any colonnade, for instance, that lacks a pediment. The introduction of the pediment introduces the element of individuality in so far as it brings in a pyramidal outline, but without the pediment there is nothing of what we have called individuality in the colonnade; its unity is obtained by the horizontal lines of stylobate and of superstructure, as well as by the horizontal succession of columns.

Most essential to the unity of a building are these long, uninterrupted horizontal lines. The base of a building is structurally designed to support a certain weight, and intellectually to appear capable of supporting it, but from a purely æsthetic standpoint its function is not that of a vertical support, but of a horizontal tie, as it is to strike the eye, irrespective of the mind, as a living something which holds the columns together and prevents them from marching away out of ranks, rather than as a mere block for them to stand on.

And this is true even more forcibly of the main cornice and the intermediate cornices, or string courses, or balconies, or whatever the projections may be that make long horizontal shadows. They are all æsthetically ties that bind; their structural function is of no importance, except this, that afterwards, when the mind has time to look into it and form an opinion concerning it, there must be nothing which shocks the judgment, as would a cornice of paper, or a string course carefully painted and shaded.

But structural considerations have no weight in the first conception of an architectural composition. It is true that the experienced architect thinks constructively, so to speak, and modifies even his dreams unconsciously so that they are capable of being built; but he dreams in pictures, rendered in black and white and tinted with grays and browns and greens.

A cornice is structurally the edge of a roof; pictorially it is a broad, black line. A string course is of little or no use structurally, but is introduced solely for the sake of the minor black line that is drawn by means of it.

In the same way a pilaster, or engaged column, is structurally intended to support concentrated weight, and must appeal to the judgment as suited to the purpose.

Pictorially, it is but a modeled, vertical line, built for the sake of the shadow it casts, and serving to cut the façade into slices standing side by side, which again are bound together by the horizontal lines.

Although we ignore the structural point of view in this book, it is only as a treatise on construction must ignore the æsthetic side: the two aspects of the subject, indissolubly united in practice, must be studied independently.

Several practical precepts result from what has been said. In the first place, to give individuality to a building, or to a part of a building, the pyramidal outline is peculiarly suited. Whether of Egyptian proportions or elongated into a Gothic spire, or flattened into a gable, or depressed into a mere pediment, the pointed outline marks the part to which it is applied with an especially forcible sense of concentration or individuality.

The same is true of domes, lanterns, and all approximations to the pyramidal. A number of buildings rising gradually one above the other, about one highest central building, like those on the fortified rock of Mont Saint Michel (Fig. 3), are united by this disposition into a single mind-picture. Even where the situation is not so striking, any ordinary group of heterogeneous parts can be "pulled together" if one of them can be arranged as a tower around which the rest cluster, as in Fig. 4.

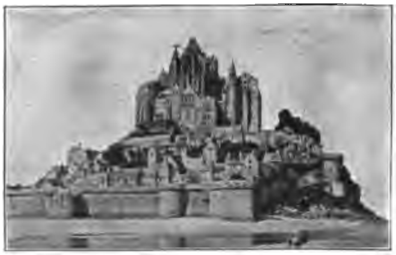


Fig. 3.
MONT SAINT MICHEL.
Effect of pyramidal arrangement in giving unity.

If for any reason the pointed outline is unavailable and we are compelled to use the square-headed outline, it is quite possible to give individuality to a square-headed mass by proper treatment; only we must remember that the square outline has not the character of individuality in itself as the pointed outline has, but requires special treatment to give it that character.

The second precept is in connection with the relative height and width of the building.

Buildings of any dimensions may have either an individual or a continuous treatment; but those in which the height is greater than the width lend themselves to the individual or vertical treatment with greater facility, while those in which the length surpasses the height are naturally suited to a continuous or horizontal treatment.

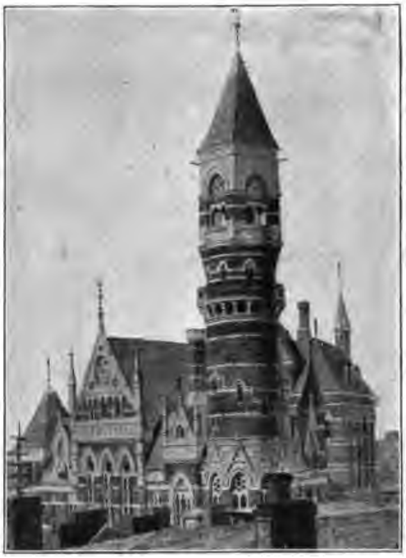


Fig. 4.

Jefferson Market Court House.

Unity given by a single dominating tower.

Of course in all buildings, whatever their relative dimensions of height to length, both horizontal and vertical lines must occur, but it is for the designer to lay stress upon one set or the other of these lines. Hence the second precept is to determine in advance whether the conditions require a relatively high building or a relatively wide building, and adapt the treatment thereto, using strongly marked horizontal lines, and vertical lines either not at all or very much more lightly drawn for the wide and low building, and, *vice* *versa*, strong vertical and fewer and lighter horizontal for the high and narrow building. It is possible, indeed, to reverse the treatment, and to design a tower with heavy horizontal lines, but more time and skill are required to obtain satisfactory results.

Beware, though, of mixing the motives of verticality and horizontality.

If we are to use a heavy projection of cornice, giving a marked horizontal treatment to our building, it is most difficult to introduce a vertical part, as a tower, in connection therewith; the unfortunate result of such a combination is shown in Fig. 5. For this reason in the Gothic styles, where vertical lines and masses predominate, the heavy cornices of the classic orders are shrunken into mere stringcourses.

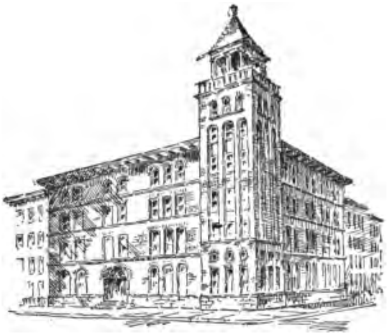


Fig. 5.
Injudicious combination of vertical and horizontal motives.

On the other hand the difficulty of assimilating a tower with classic treatment is well known; if we set it on top of the building the judgment is offended; if we carry its lines down to the ground, as the judgment demands, the strong verticality is antagonistic to the powerful horizontal lines of the portico and cornice.

It is true that by skillful treatment much may be done to unify a combination of a vertical mass and a horizontal mass. Either one may be characterized by predominating horizontal lines or by predominating vertical lines; and if the same treatment is used in both the effect of unity in the composition may be obtained.

Thus in Fig. 6 we have a combination of a horizontal and a vertical mass with three different kinds of treatment. In *a*, both the horizontal and the vertical masses receive square-headed terminations marked in both cases by heavy machicolated cornices.

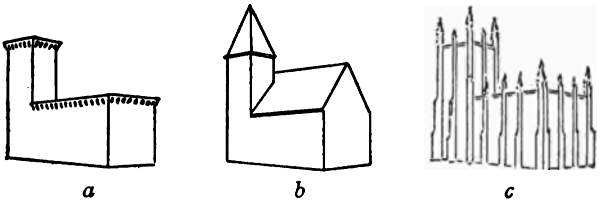


Fig. 6.
Methods of harmonizing vertical and horizontal treatment.

In *b*, both receive pointed terminations, the projection of the mouldings whence these originate being kept very slight. In *c*, the whole is cut into vertical slices by vertical lines, "pulling the parts together" effectively and completely. Although these are shown as pinnacled projections, any other sort of vertical lines, as pilasters or colonnettes of any description, would give a like result more or less completely.

Should an individual or vertical object be attached to one of strongly marked horizontal character the result is often most unfortunate, yet such a combination as that shown in Fig. 7, *a*, is frequently perpetrated by the builder who is his own architect, although no architect worthy of the name could be guilty of such an error. It is extremely interesting, however, when some such atrocity committed in the name of architecture is encountered, not to rest content with denunciation, but to question and analyze it forthwith.

Why is this thing so ugly? What general principle does it transgress? How can it be improved?

It is a very profitable exercise to assume the same conditions, as, in the above instance, an oblong block of a building with a turret on the angle, and observe what sort of treatment becomes necessary to make it presentable. It will be found that the difficulty lies in the reconciliation of the pointed termination with the strong horizontal cornice. If the pointed termination of the turret is removed and a corresponding cornice placed upon it, the first step toward a solution is taken (Fig. 7, *b*). Then, by stopping the heavy horizontal line where the turret occurs, a reasonably satisfactory result is secured.

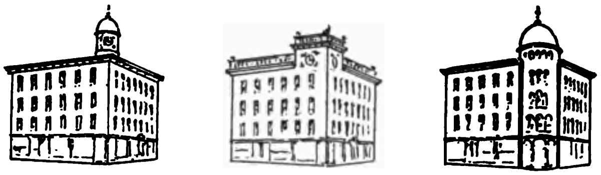

a *b* *c*

Fig. 7.
a and *c*. Improper combinations of vertical and horizontal motives.
b. Method of harmonizing such a combination.

A similar error is seen in Fig. 7, *c*, and it is one which, with various modifications, often occurs upon street corners. It usually results from the desire on the part of the owner to advertise the business by a striking architectural feature, combined with a realization on the part of the designer of the force of the constructive dictum that the lines of a tower should spring from the ground.

As in the previous example, the strong horizontal mass of the building is absolutely antagonistic to the equally strong vertical mass of the turret, accented in its individuality as it is by the dome-shaped termination.

The difficulty of combining pointed forms with horizontal ones is often felt even in monumental buildings of academic design, where pedimented forms are introduced above the main cornice, as in Fig. 8, *a*. It becomes almost imperative to carry through the horizontal line above these pediments as at *b*. Such forms are wisely avoided and square terminations used instead.

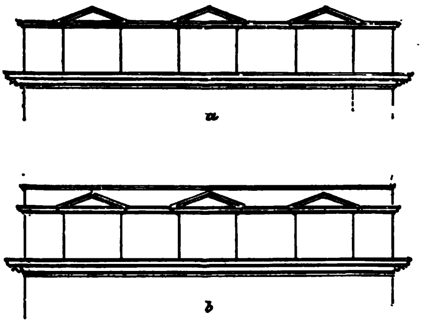


Fig. 8.

Horizontal terminal line as at *b*, preferable to accentuation of vertical parts as at *a*.

To recapitulate: First. As architecture is, in construction, fundamentally the placing of horizontal things to be supported upon vertical supports, even the arch being but a way of solving the problem that includes both factors, but does not eliminate either, so the fundamental æsthetic conception in architecture is this essential distinction between vertical and horizontal motives.

Second. All objects in which the vertical dimensions surpass the horizontal are most easily and naturally adapted to a vertical or individual treatment, with the limit in the direction of verticality marked by the solitary tower with pointed termination. On the other hand, as soon as the horizontal dimensions exceed the vertical, we may naturally turn to a horizontal treatment, with strongly marked horizontal lines and a square flat top, the extreme case being that of the classical colonnade.

In many cases, however, it becomes necessary to combine a vertical form, as a tower, with a horizontal mass; conditions which demand similar treatment for both the horizontal and vertical parts.

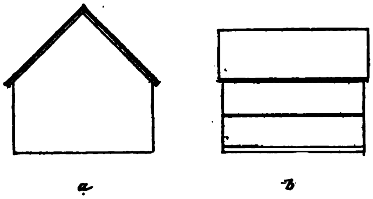


Fig. 9.

Opposite modes of treatment. *a*. Vertical and individual. *b*. Horizontal and continuous.

Third. Even in single masses, whatever their relative dimensions of height to length, either individual or continuous treatment may be used, according to the result we may wish to attain. If the object be to give striking individuality to the building a single gable may be used, as in *a*, Fig. 9, at the expense of the apparent horizontal dimensions. But if it be desired to make the most of the horizontal dimensions the opposite treatment, as at *b*, must be adopted, and everything done to diminish the apparent height and to reinforce the continuous horizontal lines.

V

SIMILARITY

THE second principle from which unity of the whole composition springs is similarity of the parts of which it is composed. We are speaking now of similarity of shape, not mathematical similarity, still less as implying anything like equality in size.

Similarity of shape should prevail among all the parts of a composition, from greatest to smallest, from dome to door panel.

To illustrate what similarity means, let us see what dissimilarity is.

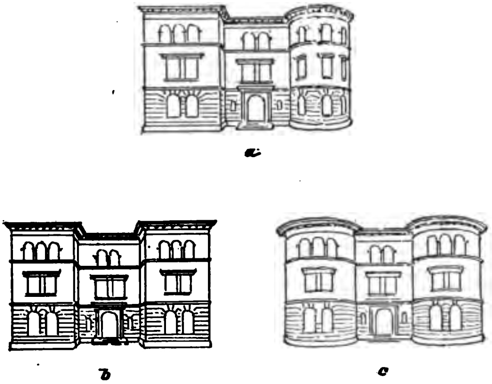


Fig. 10.
Similarity and dissimilarity of parts.

Such compositions as that shown in Fig. 10, *a*, are by no means unusual. After recessing the front, perhaps to obtain space for his portico, the designer is not content to leave the side portions plain and square: one of them he feels called upon to make circular in plan, perhaps because he thinks a round tower on a corner looks well, and so it does in some cases:

He might far better have let it alone, as all such efforts are foredoomed failures, but with both parts left square as at *b*, or both parts made round as at *c*, an excellent result may be obtained.

Yet how often is this mistake made, simply because the designer has never realized clearly the principle that dissimilarity between parts that have substantially the same function is always disagreeable.

Apart from other considerations which may demand certain departures from the rule, the effect of a building is improved if all of the openings are of the same sort, all linteled, or all round, or all pointed.

Compare, for instance, this photograph of the Palazzo Vendramini (Fig. 11) with that of a recently built house which is an adaptation of it (Fig. 12). Notice that a large part of the beauty of the original is due to the persistence of the arched openings throughout; three tiers of windows and doors, all with semicircular arches. Each window has a single mullion, and the two spaces into which it is thus divided are also arched, the tym-

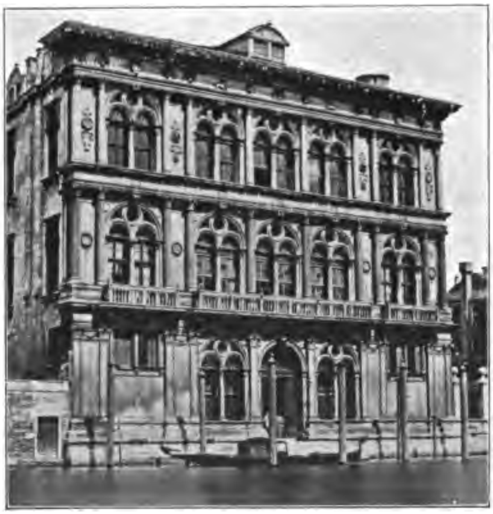


Fig. 11.
Palazzo Vendramini.
Unity of effect obtained by prevailing similarity of semicircular arches.

panum being filled by a pierced circle, somewhat after the fashion of tracery.

There is no doubt of the beauty of the arrangement to all eyes, simple or sophisticated. All this has been preserved in the modified copy up to a certain point; but in the subdivision of the windows of the latter, a straight transom is used with a mullion below, but nothing above, the semicircular tympanum being undivided. An excellent device and pleasing into the bargain in many situations, but here it quite loses the charm of the original, resulting from the similarity of the small arches over the mullion and of the larger arches which span the whole opening.

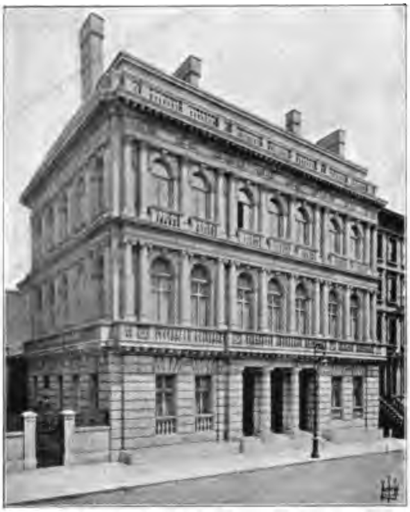


Fig. 12.
Pulitzer House.
Loss of unity by omission of some of the arches.

It may be that there is some analogy between this unison of similar forms of different sizes and the corresponding unison between musical notes of different octaves. At present this correspondence is a mere fancy, or, at the best, a plausible surmise; but at any moment the researches of psychology may show a real resemblance in the pleasure that the mind derives from such unisons, whether through the eye or the ear.

In the same way in modern dwellings even on the most modest scale it is important to preserve a similar window treatment throughout. In such buildings the sashes are often cut up diagonally into diamonds. When this treatment is used it should be carried through all the windows, and should not be alternated nor varied with sashes cut up into rectangular lights.

Often, under the impression that additional elaboration will improve the appearance, some of the sashes are complicated by the addition of curved sash bars in tortuous patterns, entirely sacrificing the charm which uniformity of treatment gives for a labored frivolity.

Such trivial details of cottage design may be deemed unworthy of attention; but it is in just such trifles of everyday practice, as well as in monumental work, that rules of composition find the test of their validity.

Another instance of the importance of similarity of parts is found in the common dictum that the pitch of all the roofs of a building should be of an equal inclination.

This rule is not absolute, as there are places where the pitch may be varied with propriety, but for the present we may give the precept full acquiescence, leaving future limitations out of the question for the moment, and note the ill results that follow divergence from the rule of similarity.

There is, not far away, a house of the ordinary kind, designed by a worthy carpenter, but all the more instructive on that account, in which he has put the enormity shown in Fig. 13, *a*.

Moved by a laudable desire to get a room in the attic, he has raised the eaves of the middle dormer, but not the ridge, putting a smaller dormer with a steeper pitch of roof alongside of it, and the round tower at the corner has made bad worse, whereas with dormers of the same pitch of roof, as at *b*, we can hardly go astray; or, if we must have a dormer large enough, or nearly large enough, for a whole room, something like *c* may be made to look as well as possible under the circumstances.

Note that as long as the pitch is more than 45° the vertical element in the composition prevails, and we may dispense with the level cornice line, but as soon as it is less than 45° the level line begins to be demanded, while at just 45° we may either use it or dispense with it.

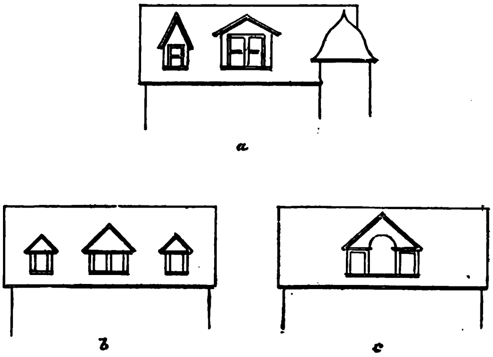


Fig. 13.
Lack of unity caused by dissimilarity at *a*.
Unity obtained by similarity at *b*.

The low pitch harmonizes with a continuous treatment and general horizontal motive, while the high pitch harmonizes with individual treatment and vertical motive. This is why the low pediment of the classical styles gives individuality to the front and at the same time does not mar the unity of the horizontal whole.

Whatever sort of treatment is used for the dormers, the same sort of treatment must be used for the main gable of the roof. If a rich or fantastic style is used for the main gables, the same sort of treatment must be used for the dormers. Not by any means an exact copy in miniature of the larger gable—on the contrary the details of the outline and ornament must be nearly on the same scale in both—but a general reflection in its forms of the larger.

The doctrine that the roofs of a building must have the same pitch remains a dry and barren formula, to be thrown aside for the slightest demands of convenience or unbridled fancy, until we realize that it is but a part of a larger doctrine, that all parts of a building that serve similar purposes, and even sometimes when they serve different purposes, are united in a harmony of the whole by a general resemblance in shape.

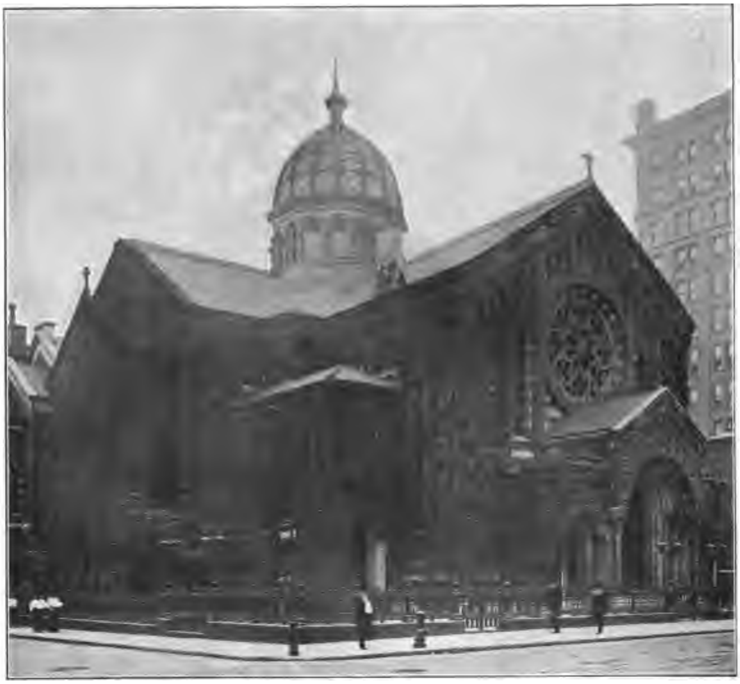


Fig. 14.
ALL SOULS CHURCH, NEW YORK.
Similarity of parts is obtained by the use of the circle and semicircle throughout.

A hemispherical dome, for instance, is felt to be appropriate in connection with semicircular arches (Fig. 14), and it is for this reason that the interior of most of the great domed buildings is more harmonious than the exterior, as the interior is a complete composition of semicircular arches in the aisles, and in the vaults of the nave, culminating in the doubly arched dome, arched upward and also arched in plan; while the exterior, with its cornices, pediments, and colonnades, to a great extent discards the arch in favor of the lintel, much to the detriment of the unity of the external appearance.

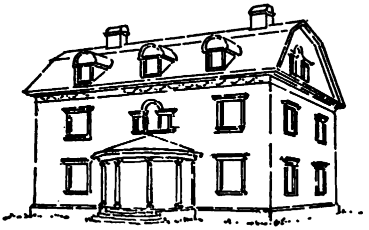


Fig. 15.
Harmonious effect of similar curves in plan as well as in elevation.

Allusion has just been made to the harmonious effect of a dome on account of its curvature in plan, as well as in elevation. As a general rule the same sort of line that is used in elevation may be used in plan with good effect. A semicircular porch often seems out of place unless some kind of circular or semicircular object is placed upon the flat front of the building to justify the curve of the porch, as in Fig. 15.

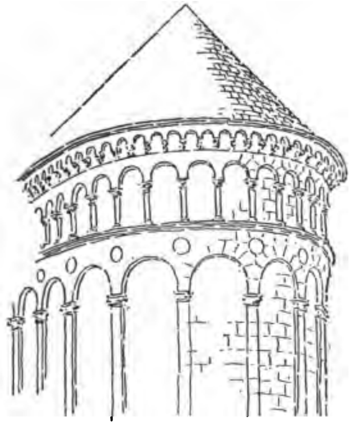


Fig. 16.
Unity produced by similarity of semicircular arches throughout.

Circular arches when introduced into a circular plan, either as a connected arcade or as separate arches, produce an admirably harmonious effect from the similarity between them (Fig. 16).

Equally graceful is the arcade on a semicircular plan from the Villa Albani, shown in Fig. 17.

For the same reason it is exceedingly difficult, if not impossible, to make a square dome, or any kind of tower, with curvilinear roof and rectangular plan, look well. To this, too, is to be attributed the out-of-place appearance of curves, whether convex or concave, in a mansard roof upon a rectangular plan.

On the other hand, dissimilarity of contiguous arches, an error to which engineers are especially prone, always gives a disjointed and painful appearance, as at Fig. 18, *a*, while an equally plain structure at *b* becomes pleasing merely because the three arches are all of like curvature.

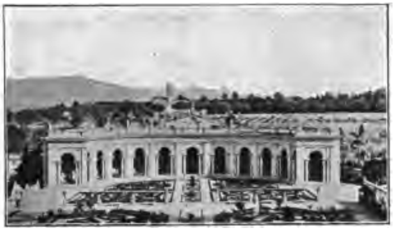


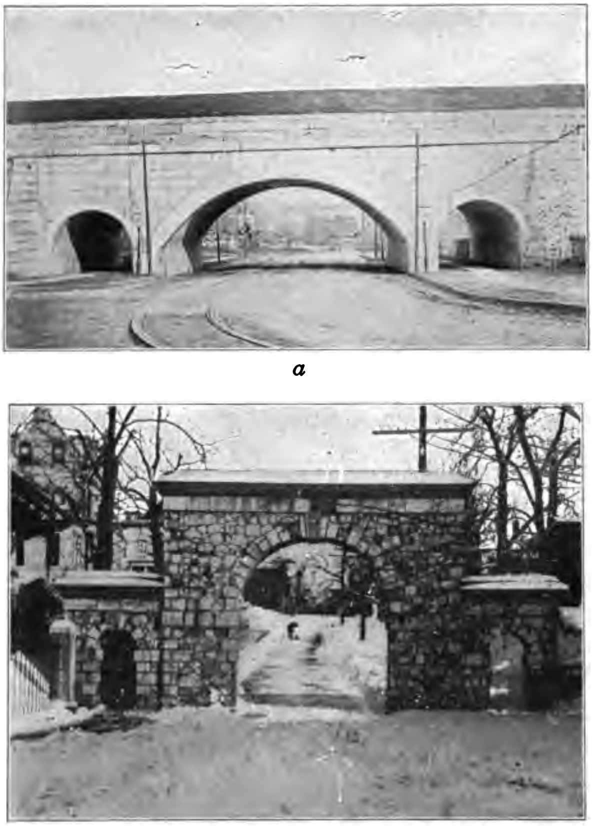
Fig. 17.
ARCADE, VILLA ALBANI.
Similarity of semicircular lines both in plan and in elevation.

Even in the most modest domestic work, a line reflecting another in a different part of the composition, whether interior or exterior, will give a pleasing effect which no richness of adornment could produce.

In Fig. 19, a sketch from an actual house, the large arch in the foreground is of the plainest, that of the fireplace is of ordinary rough brick, but, in spite of the almost bald materials, the happiest result is secured.

It is this similarity of parts that constitutes style, and the great advantage of adherence to style by copying the monuments of it in the past is that thereby a certain ready-made similarity and harmony in all parts is secured without special effort on the part of the designer.

A more intelligent method and a really worthy intellectual exercise would be the study of any transitional style with the view of modifying such parts as seem incomplete or inharmonious, substituting others which reflect better the characteristic points of the style chosen.



a

b

Fig. 18.

Inharmonious effect of dissimilar arches, *a*, and pleasing effect of similarity, *b*.

In the two perfect styles, the classical and the mediæval, this similarity of form is carried into the smallest details.

The crocketted spire of the fourteenth century Gothic church is repeated a hundred times in the crocketted pinnacles below, all very closely resembling it in both pitch and ornamentation. And the same pinnacles reappear on reredos and sedilia, in the interior, losing whatever constructional use they may originally have had, and are repeated merely as an ornamental form, deriving half of their charm from the repetition.

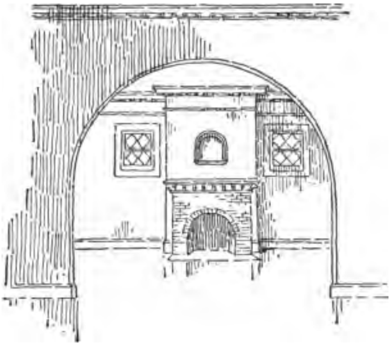


Fig. 19.
Similarity of form of various parts of a cottage interior.

In the same way the Gothic arch, originating in the construction of the vault, is repeated in the span of every window and as the head of every mullioned subdivision of the windows. Further than this, the form of the Gothic arch, cusped or plain, is used in panels cut out of the solid stone; and in the carved woodwork of the stalls both crocketted finial and cusped arch are again repeated.

Such use of constructional forms for decoration has been condemned, but it is only by their repetition as decoration that they become decorative, and their use as decoration is imperative because nothing else will harmonize with the constructive lines of the great vault above, which are forced upon us as the keynote of the style. A Gothic arch may not be in itself so graceful as a semicircular arch; a Gothic pinnacle is not intrinsically an especially beautiful object. It is only by accepting them as the best available treatment for essential constructive features, and then repeating them everywhere, playing with them, revelling in them, that a grand and perfect whole is made.

The same similarity between part and whole prevails in the classic style, although it is not so conspicuous at first glance. In that style the keynote is a regular horizontal line of columns, included by horizontal lines of stylobate and cornice.

Notice how in each column the flutings repeat the orderly line of the columns themselves (Fig. 20). Each column is itself a colonnade, although a colonnade of concaves instead of a colonnade of convexes.

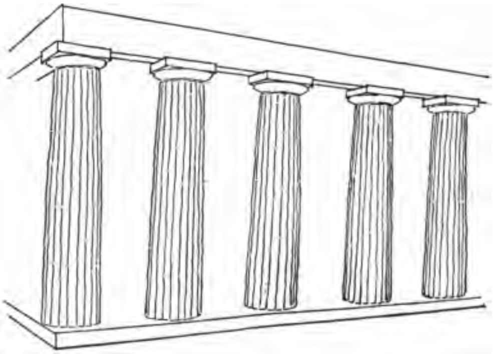


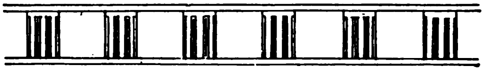
Fig. 20.

Similarity of succession of flutes on each column to that of the columns themselves.

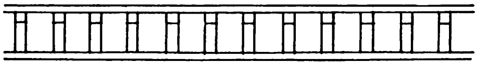
Notice, too, how every enriched moulding is the same orderly repetition of vertical lines between horizontal lines (Fig. 21). The egg and dart, the reel and ball, the bird's beak, the cymatium, are every one of them successions of vertical lines in orderly grouping, although the simple succession of single columns at equal distances, which is the keynote both of the construction and of the decorative motive, is exchanged for groups of several vertical lines joined together by different, but never antagonistic, parts.

The same note of similarity, and of harmony as springing from similarity, marks also the minor epochs, in which architectural art has reached a less complete perfection than at the two great periods. Thus the Rococo ornamentation of the time of Louis XV is marked by general employment of the double curve, both in plan and in elevation, and, whatever criticism may be made of such forms, the harmony of the result is beyond question.

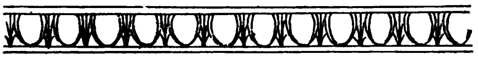
Finally, it must be noted that the subject of the previous chapter, individuality and continuity, is closely connected with that now under consideration.



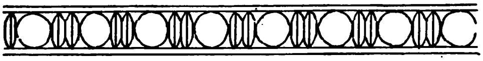
Triglyphs.



Dentils.



Egg and Dart



Bead and Reel

Fig. 21.

All minor parts composed of successions of vertical lines, included between horizontal lines.

The vertical and the horizontal elements which are necessarily the fundamental motives in architectural composition, present in every architectural design the problem of reconciling things in their nature essentially dissimilar. The solution of the problem in classic lines was accomplished by insisting as much as possible on the horizontal and subordinating the vertical; the mediæval solution is just the opposite, developing the vertical at the expense of the horizontal.

But no system of design, no style, can entirely leave out either principle, and the basis of all future developments of style must be the combination of these principles in forms which permit their repetition with modification in all parts of the completed work.

VI

SUBORDINATION

THE next principle of composition with which we must deal is subordination, that is to say, the due relation of the parts of a building to each other with regard to their size or prominence.

Hence we may define subordination to be the giving to each part of a building its proper relative importance, the word importance being broad enough to cover several different kinds of relative conspicuousness.

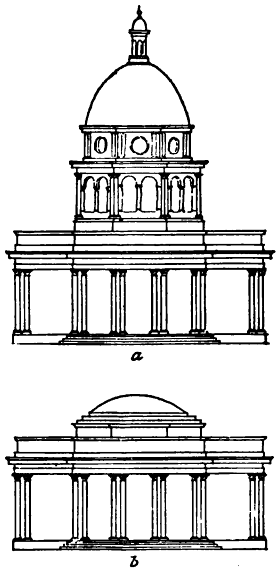


Fig. 22.

In *a* the dome is dominant, the rest of the building is subordinate, while in *b* the dome is subordinate to the building.

An illustration will make clear what is meant by subordination. In Fig. 22 are shown two domed buildings precisely alike, except that in the first, *a*, the dome is very conspicuous, towering above the main building so that it becomes the most prominent object from every point of view. In the second, *b*, the dome is low, segmental, not accentuated by a crowning lantern. In the first, therefore, we say that the building is subordinate to the dome; in the second, the dome is subordinate to the building.

There are many buildings, good

ones, too, using the word good in the usual sense in which designers use it, in which this matter of subordination is hard to determine; but even a well-designed building, it will be found, may be improved by such a judicious accentuation of parts as will leave no doubt in the mind of the critic as to which is the leading motive.

To take another instance: in Fig 23 we have another pair of buildings, just alike except that in one, *a*, the portico is a huge affair, overtopping the rest of the building; in the other, *b*, the portico is of similar proportions, with the same number of columns, and in every way just like the large one, except that it is diminished in size, until its ridge comes below the main cornice. In the former, the portico is superior and the building subordinate to it; in the latter, the building is the principal motive and the portico is subordinate.

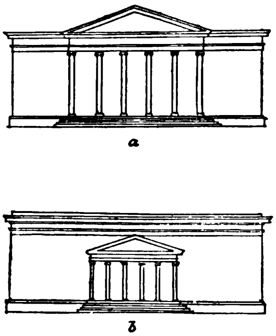


Fig. 23.
a. Subordination of building to portico. *b.* Subordination of portico to building.

Now there are several ways in which one part of a building may be made subordinate to others, of each of which we must speak briefly.

First, by a difference in height, as in Fig. 24, where the fundamental difference between the two buildings lies in the height to which the two front gables are carried.

In the first, *a*, these gables form ridges considerably higher than that of the main roof; in the second, *b*, the ridge of the main roof runs through, and those of the front gables are below it. In *b* therefore the two gables are subordinate to the horizontal mass of the main building, while in *a* the two gables are dominant and the rest of the building is subordinate to them.

When planning a building some picture of the intended exterior is always present in the mind of the designer, and a clear realization of the connection between any necessary changes in plan and the changes that are involved in the elevation is essential.

As the requirements of use demand, it may be that we are forced gradually to increase the width of the gabled projections, in working out a plan that we had intended to appear like *b*, in order to make the rooms within of sufficient size for their purpose.

As the width is increased the height of the ridge rises. If we bear in mind the natural result of this rise as terminating in the predominance of what we at first thought of as subordinate, we are not at a loss in dealing with the elevation. Our front bays have become too big to be regarded as bays any longer, but all the time we have had a fluctuating double picture in our fancy, including both the subordinate bays and the same bays when they become dominant, and we know in advance just what we shall do with them.

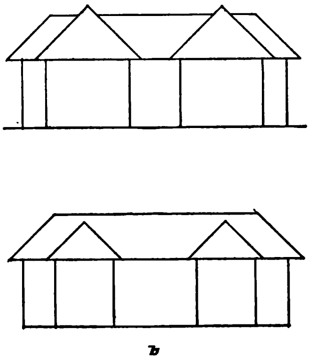


Fig. 24.

a. The main building subordinated to the two gables.
b. Gables subordinated to the mass of the building.

Quite the most powerful implement that we have for giving predominance to any part is this distinction in height. A very few inches difference in the height of the ridges in the preceding diagrams is sufficient for the purpose. Height, moreover, is the most striking dimension by which importance may be added: so much so that a tower or spire that will not compare in bulk may, by height alone, quite subordinate the rest of the edifice æsthetically. In this way the Victoria tower, from most points of view, subordinates the Westminster Parliament Houses, as that of Madison Square Garden, in New York, subordinates the building below.

The second way in which subordination is marked is by relative width. Thus many a domed building, such as the Taj Mahal, Fig. 25, has minarets attached to it, or near it, which, although of overtopping height, are subordinated by their extreme slenderness. This method, however, is chiefly used where the motive is a continuous one, and

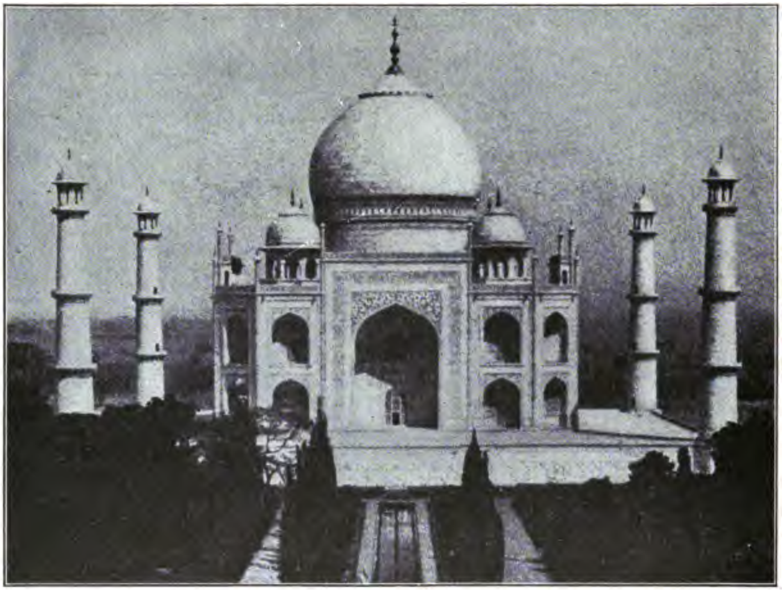


Fig. 25.
THE TAJ MAHAL.
The minarets are subordinated by their slenderness.

where variations in height would be difficult to reconcile with the horizontal lines that necessarily characterize a continuous treatment.

Thus in Fig. 26 the central pavilion is predominant chiefly by its greater width in comparison with that of the side portions. It is true, there are other slight differences of treatment, but, as far as the massing is concerned, it is the difference in width that determines the subordination.

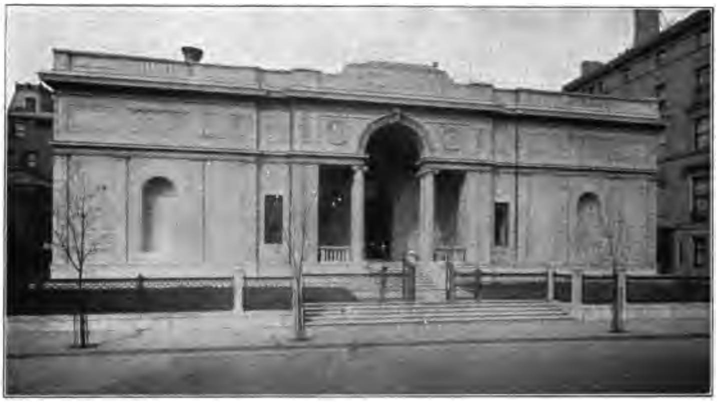


Fig. 26.
MORGAN ART GALLERY, NEW YORK.
The middle pavilion is superior to the side ones almost entirely by its greater width.

This is, of course, a different thing from the increase in width that naturally accompanies an increase in height, as occurs in the change of treatment from *b* to *a* in Fig. 24. It would be possible, indeed, to increase the height of the two bays in *b* without increasing their width, and this change in relative importance may be effected, should the interior arrangements require it, by a simple change in height without change in width, providing other necessary changes in the composition are made to unite and harmonize the very tall and narrow bays that we should thus obtain with the comparatively massive block of the main building. This kind of variation in width is merely an accompaniment of variation in height and needs no especial comment.

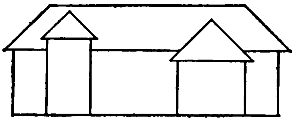


Fig. 27.

The gable on the left is subordinate in width; that on the right in height—an example of contradictory subordination.

Care should be taken upon one point, however, that increase in width does accompany increase in height and not the opposite; that is to say, that we should never attempt to make a part that we wish to be subordinate lower and at the same time broader, as such a contradiction always produces an unpleasant effect.

A modification of Fig. 24, showing a type of this error, which may be called contradictory subordination, is shown in Fig. 27. When it is desired to subordinate one of the two parts to the other it is necessary to do so by changing both the height and the width at the same time as in Fig. 28.

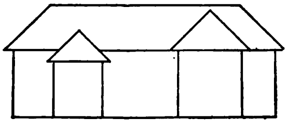


Fig. 28.

The smaller gable is properly subordinated, both in width and in height.

But it is not of width in connection with height that we were speaking, when we diverged for a moment to speak of the two in connection with each other; but rather of width alone as shown in the example given in Fig. 26. This method of giving importance to an element of the design is used chiefly in connection with compositions of a strongly marked horizontal character, in which any break in the main level cornice line is not desired, and the only increase in size that can be obtained is in width. In such a design it is usually better that the vertical parts should not have too strongly marked individuality, which would clash with the continuity that should characterize the composition as a whole; which suits well with the fact that a variation in width alone is a comparatively feeble way of marking subordination, just as its opposite, variation in height, is, as we have already noted, the most powerful.

We now come to the third way in which predominance of some parts and subordination of others may be obtained, and that is by projection, or depth.

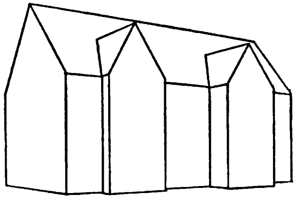


Fig. 29.

Small effect of projection in subordinating one gable to the other.

It might naturally be supposed that we are about to repeat very much the same sort of thing that we have said; and that what is true of two dimensions is true of the third, the greater the projection, the greater the importance. This, however, is not so, except to a very limited extent.

Let us consider again the two gabled[1] projections in *b*, Fig. 24, modified as in Fig. 29.

Here the two subordinate parts, equal in height and width, are shown with different projections from the wall of the main building. It will be observed that this produces little impression of difference in their relative importance. A very considerable difference in projection may thus be used provided the projecting parts are of the same sort, a qualification which we must now explain.

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[1] Gabled parts are here used for typical illustrations, because the pointed gable is the simplest way of indicating the individual parts, but it must not be supposed that these statements apply to gabled forms only. On the contrary they apply with equal force to all forms, and in actual buildings any form may be used, provided the individuality of the parts is indicated by some other suitable treatment.

Recurring to Fig. 24, we note that although the size of the gabled bays in *a* and *b* varies, their character remains the same. In both *a* and *b* they are distinct individual masses, in one case, *b*, standing in front of the main mass of the building, upon which they are placed as incidents; in the other case, *a*, they have become themselves the dominant parts, and the rest of the building is subordinate, serving only to connect them.

Let us call such as these gabled portions individual parts, and the rest of the building, whether serving as a connection or, so to speak, as a background, continuous parts.

We may now make our previous qualification precise, restate our former proposition, and say that a very considerable difference in the projection of the individual parts from the continuous parts may be given, without making any serious difference in the relative importance of the individual parts, and without in the least subordinating one of them to the other.

It is when we come to subordination of parts of different sorts, that is to say, to the subordination of continuous parts in their relation to individual parts, that projection is paramount.

Almost all modern buildings contain such individual parts, and they are found with every possible variation in projection, from forty or more feet, forming a deep courtyard, to a few inches, or even to nothing at all, a vertical line of quoin stones marking the point where there should be a projection, though this last practice is not usually successful and should be avoided if possible.

As projection is the least potent means of subordinating individual masses to each other, it is at its best as a means of separating such masses from the continuous parts; even a very slight projection, as we have just said, being sufficient to indicate what is intended.

Thus in *a*, Fig. 30, the projection of the two side parts is only a few inches, while in *b*, it may be as many feet, yet a glance shows that these are substantially the same composition, the sole difference being that the continuous connecting part is in one case recessed but a very little, in the other a great deal, from the face of the individual masses.

Frequent reference must be made hereafter, in treating of other subjects, to questions of subordination; so that little more needs now to be said about it.

It should be noted, however, that a very satisfactory unity of character may be obtained by attention to the due subordination of parts only, even if the other elements of unity be slighted or neglected. If, for instance, we can make one part very much larger than the rest, the others may be attached to the large one, of almost any size and in almost any number, providing they are relatively small.

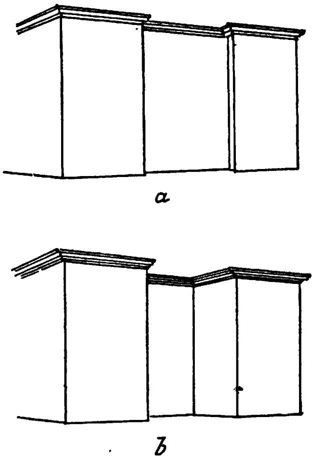


Fig. 30.
No change of motive caused by difference in projection.

Thus, in Fig. 31, the minor parts are stuck on in the most heterogeneous fashion, without in the least disturbing the placidity of the great gabled mass, simply because it is so much bigger that the eye rests upon it alone, and forgets to take account of the distracting trifles that surround it.

Observe, too, how this conclusion holds together with what has been said of the power of individuality to give unity. It has been already pointed out that the pyramidal outline was a powerful factor in unity of effect; it was also pointed out that the individuality of a vertical mass, as a tower or chimney, was sufficient to unify a varied collection of objects at the foot, this again being scarcely more than a variation of the principle of a pyramidal outline giving individuality.

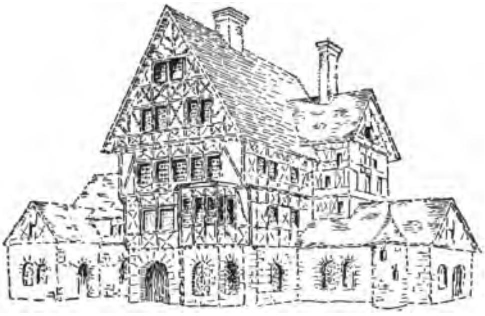


Fig. 31.
Unity obtained by the subordinating of all the minor parts.

We have thus reached substantially the same conclusion by two different roads; for what is pyramidal arrangement of parts but one in which a single part is dominant by its position as the highest, and all the rest are subordinated by their lower positions?

What is a vertical object surrounded by minor objects except a special case of a dominant object with the most favorable conditions for individuality in its shape?

But it is time for us to take up the question of parts of buildings, to analyze and classify them, giving such simple nomenclature as naturally suggests itself for convenience and clearness in speaking of them.

VII

ANALYSIS OF BUILDINGS

FOR purposes of criticism a building may be regarded as a solid bounded by fronts, using the word front somewhat inaccurately to denote the sides and rear as well as the front properly so called, each of which must be regarded as a composition in itself.

Features that dominate the whole and take their part in the composition from every point of view, as a dome or a tower, are properly regarded as a part of each front in connection with which they are visible, and are to be studied in their relation to it.

These bear also a relation to the whole of the building as seen from any point of view; a relation which is best grasped by assuming a very distant view point, and studying the whole as a silhouette. There need be little apprehension that a composition which is properly arranged in every front, and in which proper relations exist between the fronts, will not compose well from any point of view and as a whole, as well as when each front is taken separately.

While the oblique view of a building is invaluable, as the only view that shows the true relief of the different features, and a full conception of what will appear from such a point of view is essential for the proper study of the fronts, nevertheless it remains true that the plane of each front is that in which the composition must be ultimately worked out.

In point of fact, although we often, indeed, usually, see buildings from an oblique point of view, we habitually think of them as made up of fronts, and forbear to criticise until a full view of each of these is possible.

The most advantageous point of view for criticism is one so nearly in front that a full view of the whole front is obtained; and yet a little to one side, to give a proper sense of the depth of the various projecting and retreating parts.

We shall consider first the treatment of fronts as the only intelligible way in which to approach the subject; and as the way in which it is necessarily handled by practical designers on the drawing board.

Let us go back now to the second illustration of the sixth chapter, Fig. 23.

In the lower figure, *b*, the main building is evidently dominant and the portico is subordinate; in the upper figure, *a*, the portico has outgrown the building and has itself become the dominant part, while the building is attached to it on each side as two wings.

Again, in the next figure of Chapter VI, Fig. 24, in the second diagram, *b*, the two gables are set in front of the main building and are lower than it is, and just as clearly in this case, the two bays are subordinate to the main mass of the building, as was the portico in Fig. 23, *b*, while at *a* the two gables are dominant and the rest is subordinate, as was the portico in Fig. 23, *a*.

In all buildings that are composed of separable parts, the arrangements, however complex, may be pictured in the mind as capable of undergoing similar transformation by the increase or diminution of the individual parts from the point at which they are manifestly subordinate to the main mass of the building to the point at which they become themselves the main masses, in relation to which the rest of the building has become merely a connective member or an attached wing.

It is well to learn to regard all compositions as in a state of possible flux, for in the work of practical designing great flexibility of mind is thereby acquired.

Much as the manufacture of a new nomenclature is to be deprecated, it becomes necessary for us to give names to the results of this increase or diminution, for convenience of reference in future; in doing so let us use the simplest and most descriptive of plain English words that we can find.

Let us then call the individual parts primary masses, when they are the principal parts of the front and all the rest is subordinate to them; whether a single part, as the pediment in Fig. 23, *a*, or two or more parts, as the gabled bays in Fig. 24, *a*.

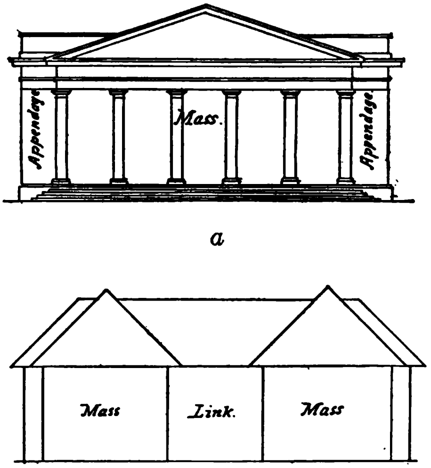
On the other hand, when such individual parts are diminished in size until they are subordinate to the building, to the front of which they are then attached, let us call them secondary masses.

These terms are applicable to the parts of a building which have the relations described, whatever their shape or function. Pavilions, towers, colonnades, arcades, tourelles, and plain walled cells, all are comprehended under the term masses; and their relative size marks them as primary or secondary.

One step further: In Fig. 24, *a*, the two gabled parts, that constitute two primary masses, are connected by a portion of what would become the main mass of the building if the primary masses were removed. Now it serves only to connect these primary masses. This function of connecting is, however, a fundamental one, for without such connection primary masses cease to be parts, and become merely separate buildings, accidentally juxtaposed, producing the same annoyance in the mind as a row of speculative builders' cottages, each separated by its four-foot alley, and all precisely alike.

Let us call this part which connects the primary masses a link, indicating indissoluble binding together as its essential office.

There are two other parts, the remnants of the ends of the building, that are left projecting when we increase the size of our individual masses from secondary to primary, Fig. 32, *a* and *b*.



a

b

Fig. 32.
Single and double primary masses, with connecting and attached remnants of building.

If we continue to increase the size of the primary masses these projecting parts become evanescent, and finally vanish altogether, as in Fig. 33, *a*, where the single mass of the portico has grown until it has obliterated the side portions, and in Fig. 33, *b*, where the double gabled masses have likewise absorbed them.

Let us call these side portions by the most natural and forceful name, that indicates at once their subordinate position and the possibility of dispensing with them altogether: let us call them appendages.

As the individual objects may be primary or secondary, so links and appendages may be primary or secondary. Such a porch as Fig. 34 is to be reckoned as a secondary mass with secondary appendages. It is convenient to speak of primary links, together with the primary masses which they connect, and the primary appendages which may be attached, as parts of the first order; and correspondingly of secondary masses, links and appendages, as parts of the second order.

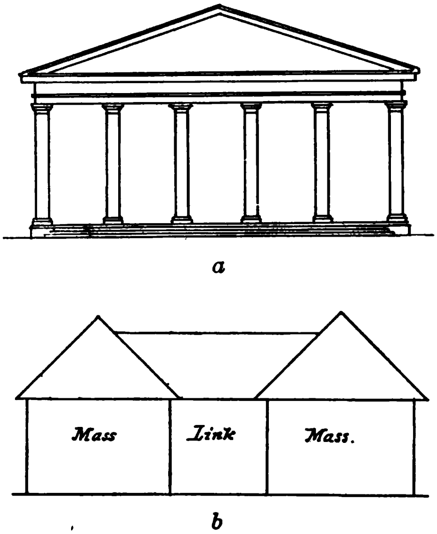


Fig. 33.
Single and double primary masses increased until appendages are lost.

There is another kind of secondary masses to be noted, in addition to those already described; that is to say, parts that are placed above the parts of the first order, instead of projecting in plan from them. Such are ridge turrets, domes, when so small that they are dominated by the building instead of dominating it, and dormers, in relation to the wall from which they rise, although in relation to the roof behind they are projections in plan.

In addition to these primary and secondary masses, links, and appendages, there is a third set of objects to be distinguished.

This includes a heterogeneous collection of objects, such as doors, windows, chimneys, columns, brackets, arches, panels, cartouches, and smaller turrets, and dormers.

All of these we will rank together under the comprehensive term of details, a word which is generally used by architects for even smaller subdivisions than these, but which in its ordinary, untechnical sense, conveys our meaning well enough, and avoids the misery of coining any new nomenclature.

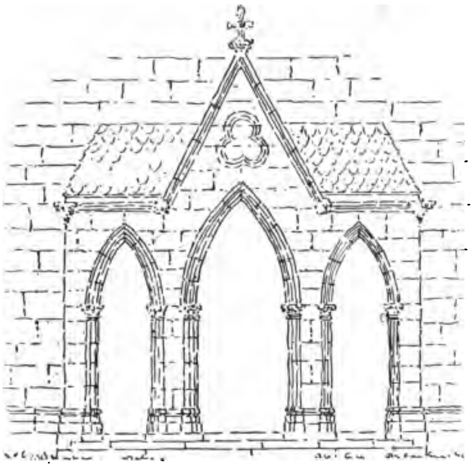


Fig. 34.
Secondary mass with appendages.

It is to be observed that there is nothing hard and fast about this analysis and classification.

A chimney may be unimportant enough to be disregarded entirely, even as a detail; or it may be large enough to figure in the composition as one of the leading secondary masses; or a dormer may be of that intermediate size that makes it doubtful whether it should be ranked as a detail or a secondary mass.

And sometimes an object may be found which fulfils a double purpose, which is secondary in one relation and primary in another; or detail in one and secondary in another.

It may be convenient at times hereafter to speak of such objects of detail as parts of the third order, or tertiary parts.

VIII

PRIMARY MASSES

IN addition to the qualities that we have already noted, the unity of an architectural composition depends upon the number of the primary masses that form the bulk of the building.

It is unnecessary to dwell upon the undisputed fact that a building consisting of a single primary mass possesses unity in the highest degree in its elementary conception. Nothing can be more characterized by singleness and concentration of idea, which is, after all, what unity means, than that which is conspicuously and unmistakably one.

Such are a pyramid and a Parthenon, a Venetian Campanile and a Pisan Baptistery; and such, too, are a Strozzi palace, a Colosseum and a Radcliffe library.

When circumstances permit the adoption of a single primary mass as the motive of our building, it is not to be lightly sacrificed by the ill-considered addition of parts, "to relieve it," or "to give variety." The simplicity and dignity that inhere in singleness of mass we may often endeavor in vain to find in other more complex motives.

When a building is of small size, like many country dwelling houses, the absolute plainness of the four walls and roof are sometimes too bald to be satisfying. "A mere box of a house," is the complaint; and a well-founded complaint it often is. Yet the remedy is not to cut it to pieces in such a way as to destroy this singleness of mass, but rather to adorn it with subordinate secondary or tertiary parts, as will be hereafter shown.

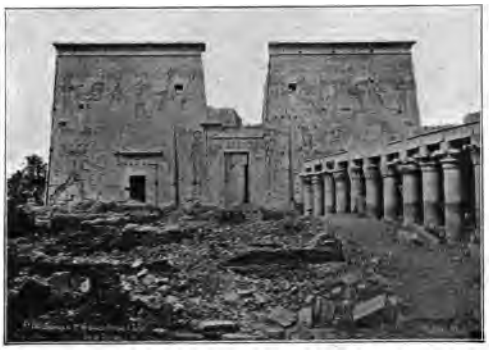


Fig. 35*a*.
Pylons of Temple at Philæ.

But in the case of large city fronts of stores or warehouses, where flatness is forced upon us by the necessity of covering the entire lot, and where the dignity of a single mass is not missed by lack of size, it is a mistake to attempt to make vertical breaks in the continuity of the horizontal lines. Such breaks often cannot be more than eight inches, perhaps only four inches, and these are quite inadequate to make up for the loss of the continuity of the motive that naturally belongs to all buildings of the kind.

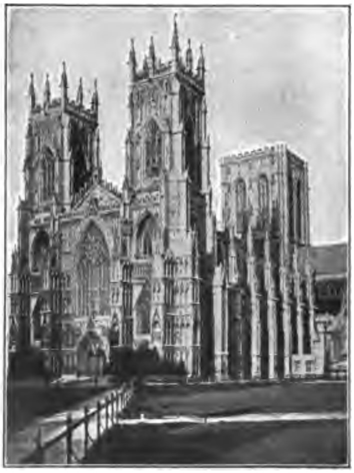


Fig. 35*b*.
York Cathedral.

Leaving the single primary mass, we come to the question of two such masses.

In all ages we find what are virtually two separate buildings, each of a distinct identity, joined together by another part, used as the motive of a composition.

Compare, for instance, in

Fig. 35, the pylons of an Egyptian temple, the twin towers of a church, the two pavilions of a French court house, and the double gables of many an ordinary American frame house, and note, what is really a very remarkable fact, that the two masses in each case, when properly joined together, appeal to the eye and to the mind as a single whole, that is to say, the quality that we call unity attaches to the combination in a very high degree.

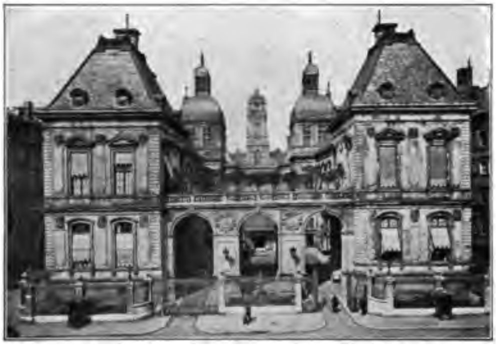


Fig. 35*c*.
Hotel de Ville, Lyons.

Just why this should be so is a problem for psychologists, who are daily conquering new realms. Certainly a motive which persists thus through thirty centuries must be regarded as an established principle of composition and available in all styles.

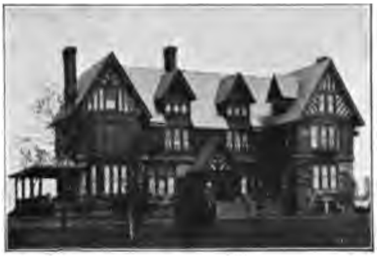


Fig. 35*d*.

There are two notable conditions attached to such a combination, which unfulfilled, the combination ceases to be a combination, and the two objects stand separate, appealing to the eye as individuals only.

In the first place there must be a visible connecting link of some sort to tie them together.

Without this connection there arises a peculiar and disagreeable sense of æsthetic uncertainty and superfluity; uncertainty as to the point of concentration of attention, somewhat like the feeling of physical doubt when two doorways, exactly alike, are placed near each other, and we stand hesitating, not knowing which to enter. There is also a feeling of superfluity, of one too many, which we find in other situations where a strongly individual form is placed near another without evident connection, and without sufficient difference in size to indicate which is subordinate to the other. Such a case occurs where two pediments are put one closely over the other, Fig. 36, or when two gables occur contiguously either at an angle, as in Fig. 37, *a*, or upon the face of a composition, as at Fig. 37, *b*.

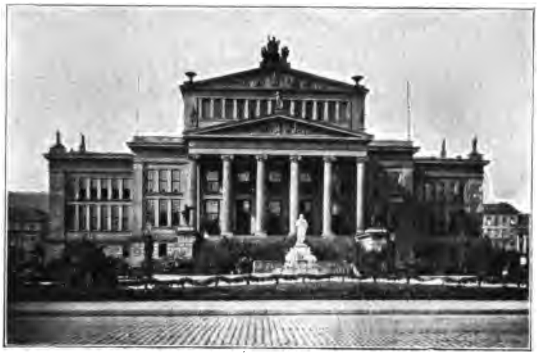


Fig. 36.

COMEDY THEATRE, BERLIN.

Lack of unity between two pediments caused by contiguity without subordination.

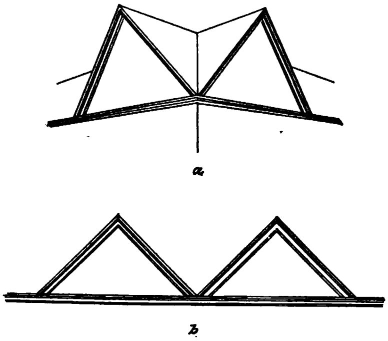


Fig. 37.

Lack of unity caused by contiguity with neither connection nor subordination.

The same sense of sepa-

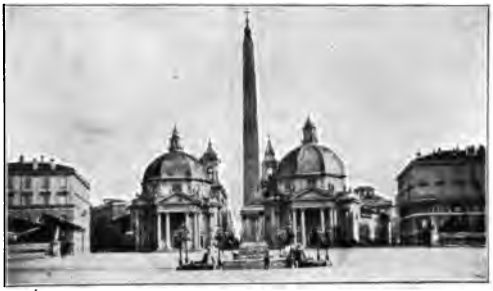


Fig. 38.
Two masses lacking unity from the absence of a connecting link.

ration as occurs when there is no linking part to connect them, is felt when the recess between is so deep that the link is not easily seen. This often happens in New York apartment houses where the need of light and air produces a plan having this defect æsthetically. Here, in Fig. 38, is an example of two buildings precisely alike, without a connecting link,[1] and at Fig. 39 is one of a building in two parts with the connecting link out of sight. Another, at Fig. 40, is much the same. in arrangement, but the architect has added a great arch, carrying a piece of cornice between to bridge the interval; of which we may say that, if

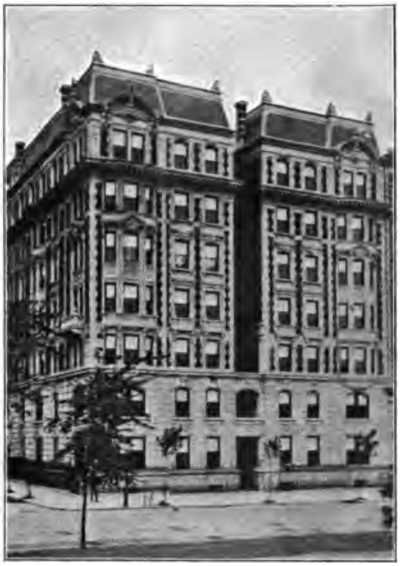


Fig. 39.
CHERBOURG APARTMENT HOUSE, NEW YORK.

Upper part of connecting link is out of sight.

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[1] The lack of unity would be more noticeable if the obelisk were omitted from the view. This serves as a partial connection between the two domed buildings.

not entirely successful, it is certainly evidence that the need of some connection was felt.

The second condition is that the two connected parts shall be similar. This brings us back to Fig. 10 *a*, which has already been twice condemned on previous occasions. We now condemn it again on the ground that while it purports to connect two equal individuals of equal race and rank it fails to do so; and instead joins together an unequally matched pair, of hostile race and alien feeling. It is a case of architectural miscegenation.

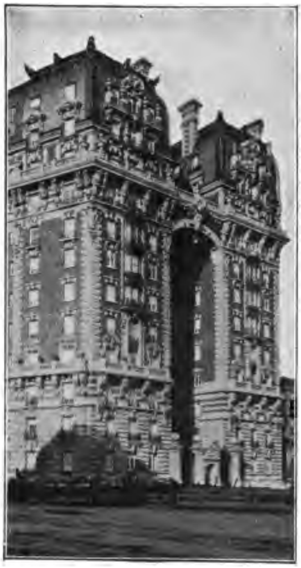

Fig. 40.

DORILTON APARTMENT HOUSE, NEW YORK.

The great arch spans an open court. It has nothing behind it, and is put in purely to serve an æsthetic purpose as a connecting link.

So again in Fig. 41, where we have a common case of carpenter's architecture. It is easy to pass the whole thing as unworthy of criticism, but more instructive to question ourselves, in order to learn why we do not like it. It will be found that in addition to other, and compara-

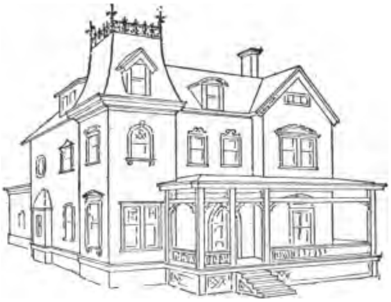

Fig. 41.

The fundamental defect is the lack of similarity between the two masses, the mansard roof and the gable.

tively venial, sins, the great crime that it commits is this equal union of totally different individual parts.

Frequently, again, the same mistake is seen in the design of towers that are attached to and form a part of a building.

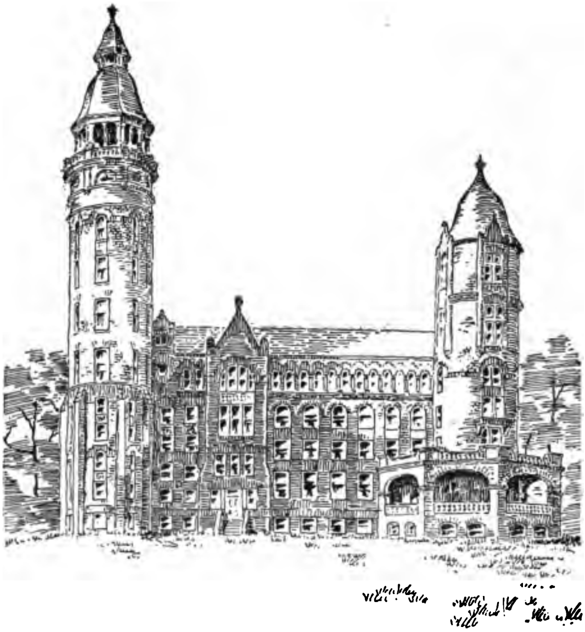

Fig. 42.
Ill effect caused by the dissimilarity of the two towers.

In order to obtain "variety" one of these is sometimes made entirely different from the other, with a peculiarly unfortunate result, as in Fig. 42.

Put it down as axiomatic that, wherever contrast may be permissible, it is not so in any case like this; that is to say, that wherever a design is composed of two primary masses these must be substantially alike.

But, when we pass from the quale to the quantum; from the question of what kind shall these two masses be to the question of how large shall they be, we find an entirely different reply.

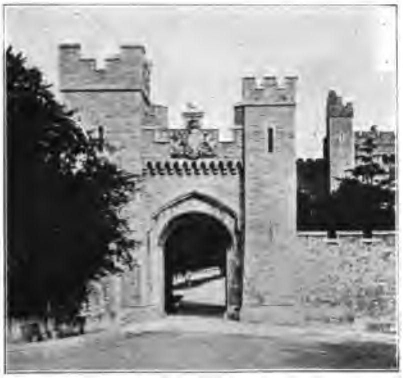

Fig. 43.
Entrance Gateway to Arundel Castle.

Two primary masses of like kind but of unequal size.

It is true that compositions of equal twin masses preponderate, as far as the number of examples that can be cited is concerned, but there are enough of the unequal type extant, and they are of such pleasing appearance as to justify us in regarding a composition of two similar but unequal masses as admissible.

Throughout the period of mediæval architecture the westerly spires of the church were often made unequal. The same sort of thing is shown in a much more modest building, a simple entrance lodge at Fig. 43, and of later work there are the well known unequal domes of Santa Maria della Salute, at Venice.

In recent work the motive is used in many domestic examples such as that shown in Fig. 44, and in at least one notable and admirable example, the office building, at St. Paul, Minnesota, at Fig. 45. The south front of the Westminster Parliament Buildings shows the same motive, Fig. 46. Observe that in all of these, in spite of the difference in size, the general similarity in form is everywhere maintained.

The harmony between two unequal masses, although not that which prevails between twin masses, has a parallel in other architectural features. It is closely connected with the repetition on a smaller scale of the cornice by the tænia of the ovolo of the capital by the neck moulding, and of the lower torus, in the Attic base, by the upper one (Fig. 47).

Indeed, with the necessary modifications to adapt them to the larger scale, these might be turned sidewise and used as the motive for a façade, as the Attic base in Fig. 48. Of course it is not meant especially to commend the semicircular outline for a gable, but only to show the analogy between this and such a scheme as the St. Paul office building façade.

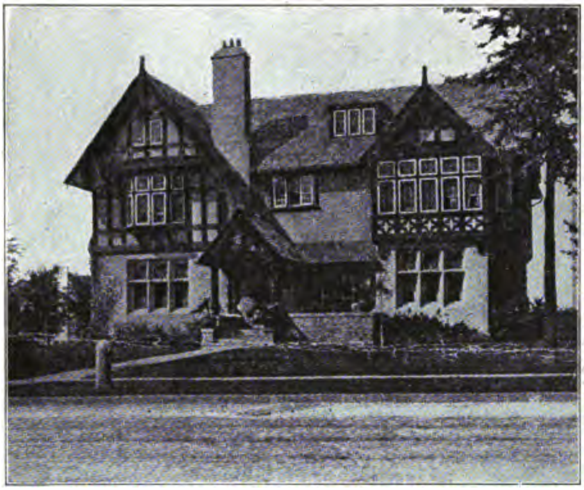

Fig. 44.
House at Detroit, Mich.
Two unequal gables.

Passing on from compositions of two masses, whether symmetrical or asymmetrical, we come to those of three

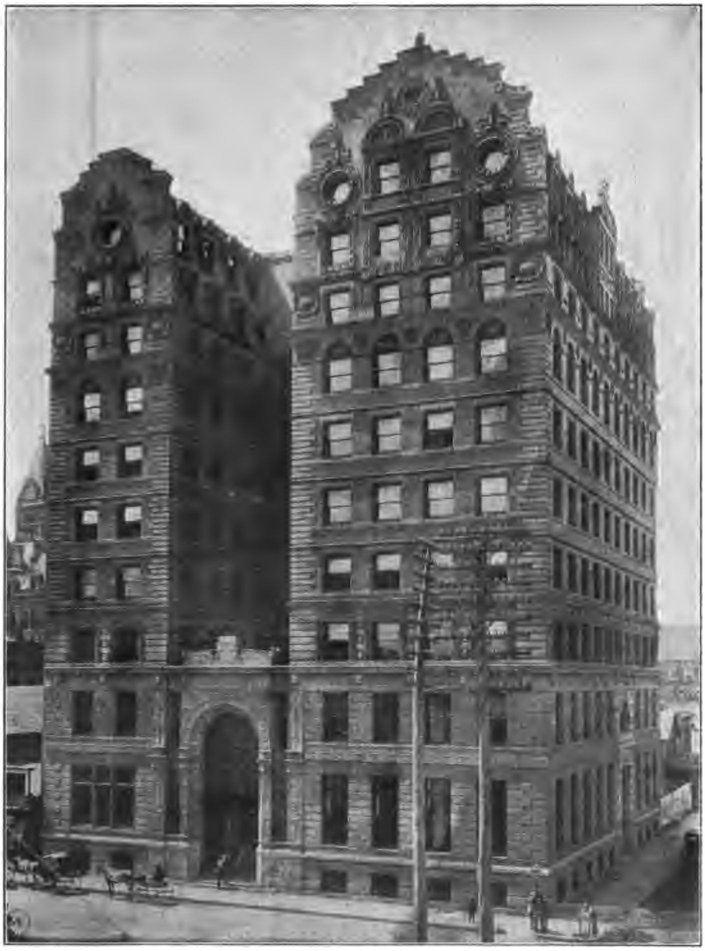

Fig. 45.

OFFICE BUILDING, ST. PAUL, MINN.

Excellent example of two unequal primary masses, connected by a link.

masses. Such are found in great profusion and of all varieties, but we search in vain for anything corresponding to the two masses that is the rule in compositions of two; that is to say, we search in vain for designs composed of three masses, all of the same size and all substantially alike. An example of the nearest that usually occurs is this shown in Fig. 49. Yet even here the central gable is noticeably wider and higher than those on each side. Here, at Fig. 50, is one of the very few examples in which the three masses are apparently precisely alike, which shows quite clearly that three equal primary masses cannot be made to hold together as a single impression. Yet even here closer observation shows that the middle tower is somewhat smaller, instead of larger, than the other two; so instinctive is the avoidance of exact equality. Again, a third illustration is

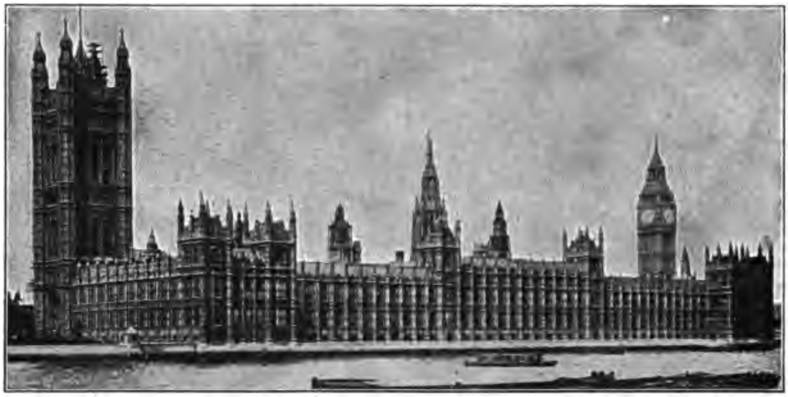

Fig. 46.

WESTMINSTER PARLIAMENT BUILDINGS.

The south front, that to the left, and not shown very well in the illustration, is a composition of two unequal towers, connected by the building between.

at Fig. 51, in which the three pavilions are very nearly alike, with many small differences which are evident on close examination; but such examples are rare, and in perfection, that is with absolutely nothing to distinguish the central from the side masses, none, or almost none, exist.

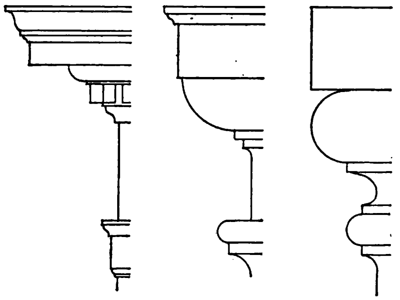

Fig. 47.
Compositions of details parallel to that of two primary unequal masses.

Of the other kind, in which the central mass differs from the side masses, the examples, as we have said, are innumerable. In Fig. 52 are seen four of these, arranged progressively, from *a*, in which the three masses are most nearly alike and equal, to *d*, in which they differ widely, both in relative size and in shape.

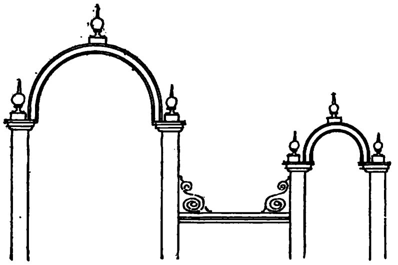

Fig. 48.
Analogy of outline of Attic base to a composition of two unequal primary masses.

In *a*, the three pavilions have but little relief, and there is no difference in height at all, the main cornice line running through. The general design of the pavilions is similar, the central one being marked by a pair of subordinate masses in the shape of rather inconspicuous corner projections. The topping out of both sides and centre is nearly the same in general effect.

In *b*, the disposition is substantially the same, but the projection of the central mass is greater in comparison with that of the side masses. In *c*, the central mass is crowned with a bulging mansard, and the side masses with mansards of rectilinear outline, all three being about equal in size.

In *d*, the central mass has far outgrown the others, and at the same time has totally changed in character, having become a great dome, the two flanking masses being spires of classical detail.[1]

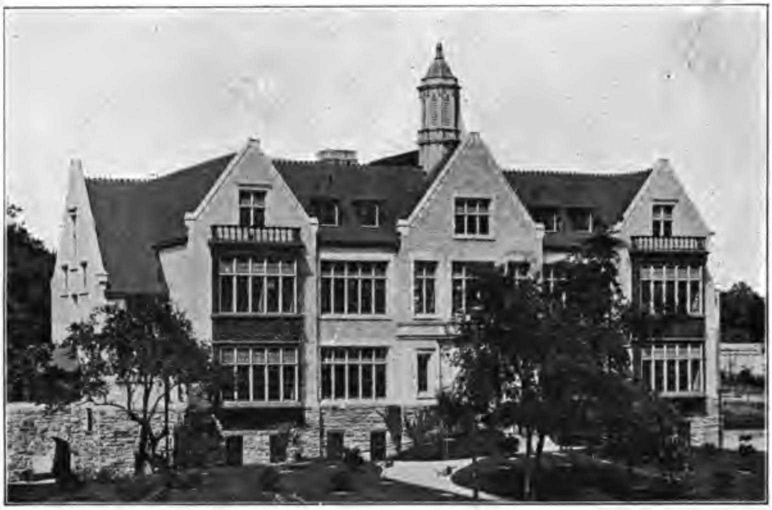

Fig. 49.
MORRIS HEIGHTS SCHOOL, NEW YORK CITY.
Three nearly equal masses.

Many other examples might be interpolated between these, constituting a regular series; those shown are enough to illustrate the chief steps in the progression.

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[1] Properly the illustration should be a view of the west front, in order that the dome might appear as the central mass, between the two towers.

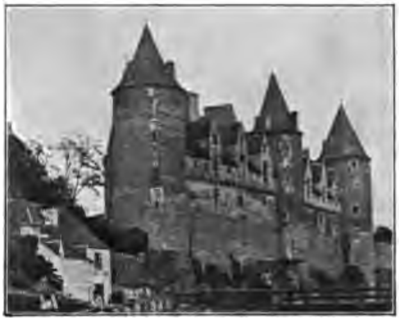


Fig. 50.
CHATEAU DE JOSSELYN.
Lack of unity of three equal masses.

It appears that wherever three masses are used there is a strong tendency to break up the group of three into a single central predominating mass and a subordinate group of two. So much is this the case that most of such designs would make very passable compositions if either the central or the side masses were wiped out altogether. This tendency is analogous to a similar tendency which psychologists have observed in a rhythmic succession of three beats to break up into a one-two rhythm, double measure, the first beat being made equal to the second and third together; and to the well-known tendency of the even-measure glide waltz to become a two-step.

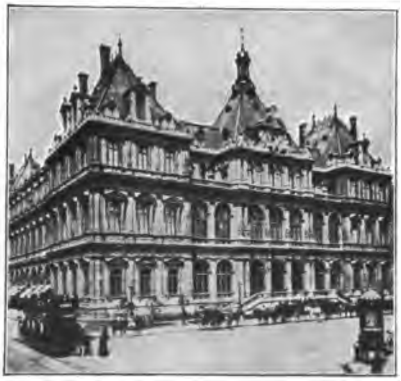
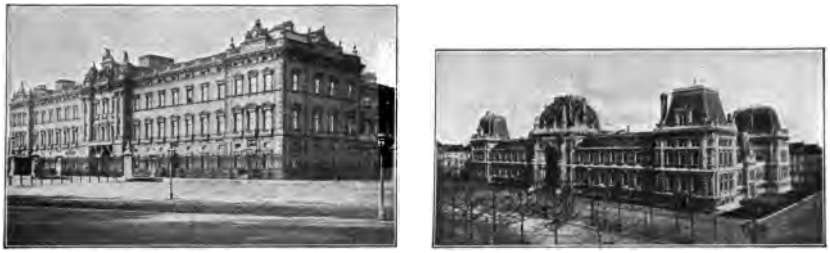


Fig. 51.
THE BOURSE, LYONS.
Three equal masses, the middle one marked by many minor differences.

They are like two separate compositions, one of two masses with their link and another of a single mass with appendages, welded together into a single design.

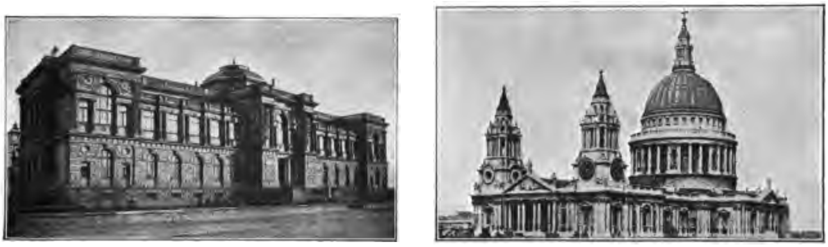
The lesson to be learned from observation of these and of others of the same sort is this: The more nearly the three masses used are equal in size, the more closely they must resemble each other in appearance.

In such a design as *c*, Fig. 52, it would be a great improvement if the side pavilions could be reduced in width to two windows instead of three, the cornice lowered nearly to the same height as the cornice of the link, and the mansard reduced to a height matching the reduced width, thus distinctly subordinating the double motive to the single. As it stands, with the striking difference in treatment announcing the central mass as something different from the



a. Buckingham Palace.

c. Palais de Justice, Antwerp.



b. Stoedel Art Gallery, Frankfort-on-the-Main.

d. St. Paul's Cathedral, London.

Fig. 52.

Three masses, showing increasing degree of difference between middle and side masses both in size and form, from *a*, which shows the least, to *d*, which shows the most.

others, yet with no corresponding preponderance in dimensions, the mind is left in a state of doubt almost as painful as that which is caused by two equal masses of totally different treatment.

On the other hand, no matter how great may be the difference in size, it is always possible to use a substantially similar treatment. Such a design is shown in Fig. 25, in which the central and side masses and even the minarets surrounding are topped by domes of nearly similar shape.

It seems reasonable to speak of these latter only as groups of three masses, or triple groups; describing those wherein the central mass is very different in design, as well as predominant in size, as a single mass with secondary double masses.

The upshot of the whole is this: Whatever may be the mode of elaborating our composition; whether with subordinate masses or details, or both; whether the motive is to be horizontal and continuous or vertical and individual, as a foundation for it we may assume any one of three arrangements of the mass, with at least two variations. The three motives are, naturally, the single mass and the double and triple groups of masses; while the double mass may be varied by the asymmetrical treatment, and the triple, by augmenting the central mass and assigning to it such differing design as shall mark it as a thing by itself, dominant over the whole composition, and not a mere one among three equals. A clear conception of these five possibilities—and there are no more—adds to the power of the designer to an extent that is out of all proportion to the lucid simplicity of the facts, when once thus catalogued and generalized.

As for asymmetrical triple groups, it may be possible to make as coherent a composition with these as with an asymmetrical double motive, although hitherto this arrangement has been not frequently used, or perhaps not at all.

If we go a step further, and inquire concerning the possibilities of a group of four masses, we find that there exists almost none, though there is a stray example here and there, of which not any is satisfactory; of such the Tower of London is perhaps the best known.

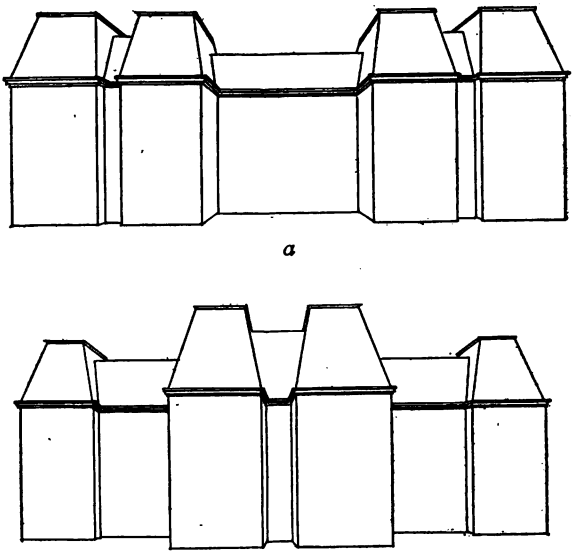
It seems that beyond three, the mind fails to grasp a group of objects as a unit, and receives in place of unity an impression of vague plurality. This is caused, not by intellectual incapacity to apprehend larger numbers, as is the case with some savages, but by a psychological tendency to unite one object with another on one side of it, or with one on each side, but not more.

Let the designer sit down with drawing board and pencil, and try to make something out of four equal objects. He will find himself doing one of two things: either distributing the four in two groups of two each, as at *a*, Fig. 53, or putting a group of two in the middle with one on each side as at *b*, of the same figure; in the first case making what is virtually a compound double group, and in the second a parallel compound double group for the central mass of a triple combination.

Here, in Fig. 54, is an actual example of this latter arrangement. The four towers are equal, and nearly equally disposed; yet the two innermost are connected to form a compound double central mass. Yet even here, in spite of the impressiveness of the four round towers, the composition "scatters" and does not hold together as a unit to the eye. A slight diminution in the size of the flanking towers will be found to improve the appearance of the whole.

A parallel exists in the relation of sequence, that we call rhythm; in which psychology has found that beyond a rhythmic recurrence of two beats or three beats in a measure a separation occurs, so that a measure of four beats is divided into two measures of two beats each, spontaneously and unconsciously.

Nor is it any more possible to construct a unit out of five primary masses. As soon as we pass beyond three, we might



a

b

Fig. 53.
Two methods of giving unity to four masses.

as well put a dozen or a score, for all alike lack concentration and oneness; tending ever, as we increase the number of units, to that sense of infinity that attaches to a wall fortified with towers at equal intervals of which the eye can discern neither beginning nor ending.

There is a striking parallel to the grouping of masses that we have just discussed in the grouping used in paintings by the masters, in the day when composition in the "grand style" recognized certain types of arrangement.

Take as an instance of a group of three the well-known Sistine Madonna (Fig. 55), with the Virgin central, and the pope and saint on each side, corresponding as closely as possible with the front view of many a domed building, with flanking towers, such as St. Paul's or the Taj Mahal.

This painting is also an example of the pyramidal grouping which produces unity of effect as much in painting as in architecture. It may be noted that the antithetical arrangement, the continuous horizontal group, is not often used in easel pictures, but is found in sculptured and painted friezes, in which even distribution, and not concentration, is the effect sought.

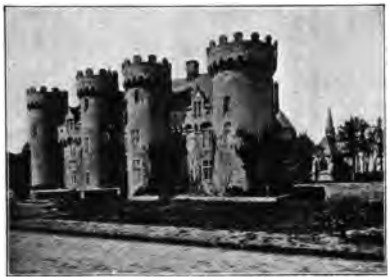


Fig. 54.
CHATEAU DE VILLEBON.

Four equal masses, of which the two innermost are more closely connected.

The parallel to the double architectural group is found in the other classical grouping in painting, high at the sides and low in the middle, as seen in Fig. 56, a "Nativity," in which the two figures are connected by the recumbent infant, which forms the link.

Of these two groupings in combination, together with the single figure, most of the great paintings of the past are composed.

Thus Raphael's "Transfiguration," Fig. 57, contains two triple groups in the background, the upper pyramidally, the lower horizontally arranged, and what corresponds to a double group, low in the middle and high at the sides, in the foreground, although here each member is composed of several figures, as is also the link between them. This link,

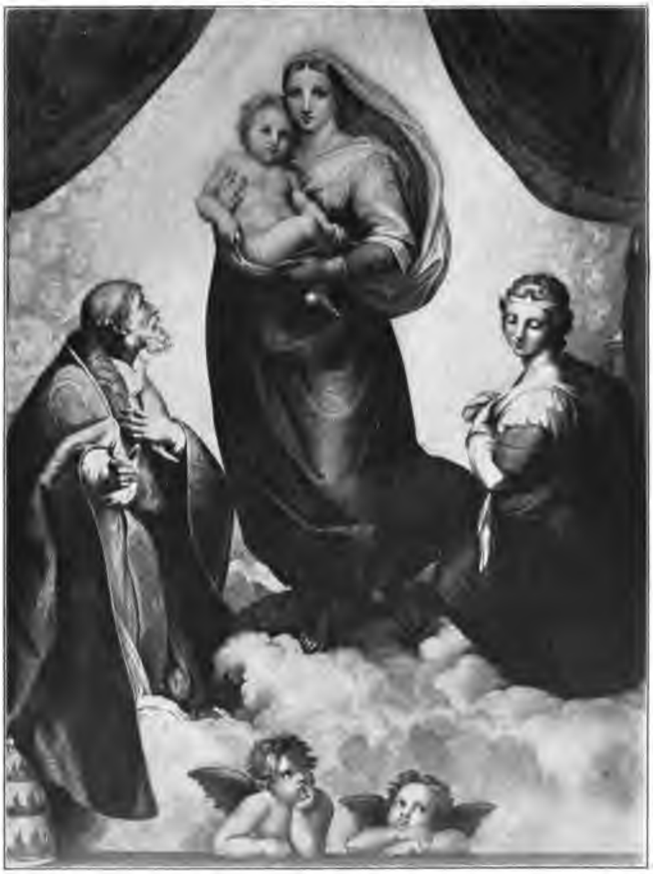


Fig. 55.
THE SISTINE MADONNA.

Triple masses as used in painting, the central predominating, a close analogue to the corresponding composition in architecture.

composed of four figures in the background, in the original is subordinated in color, which cannot be shown in a black and white copy.

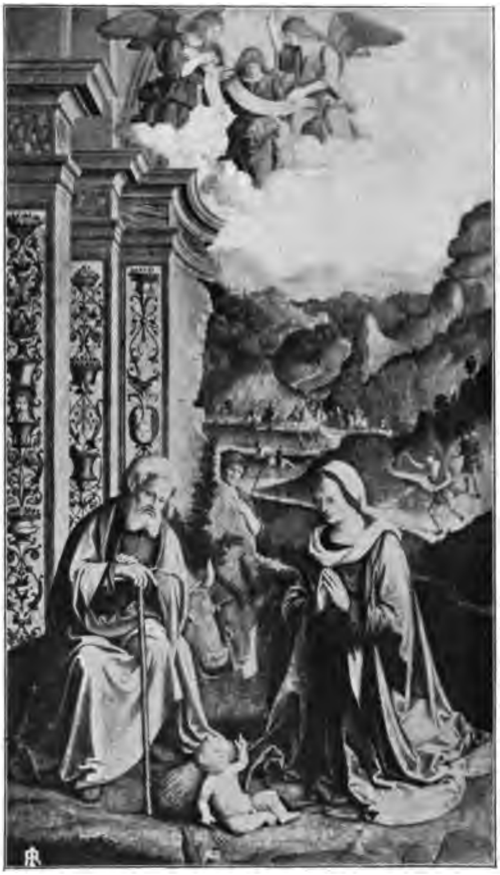


Fig. 56.

Nativity, Marco Palmizzano.

The principal figures form two primary masses, between which the infant figure serves as a connecting link.

It would seem to be a daring proposition to say that it is possible to classify all the buildings in existence under one or the other of the foregoing heads with respect to its primary massing; but, if allowance be made for many that are thrown together by accident, a part perhaps built at one period, and a part at another, or for those that are built to give the impression of such piecemeal construction; and further allowance for the innumerable factories, city dwellings, tenements, and the like, which are of no account as architecture, it will be found that all buildings intended to please the eye do fall in one or the other of the above described classes.

In Fig. 58 is shown a diagram of such classification. It

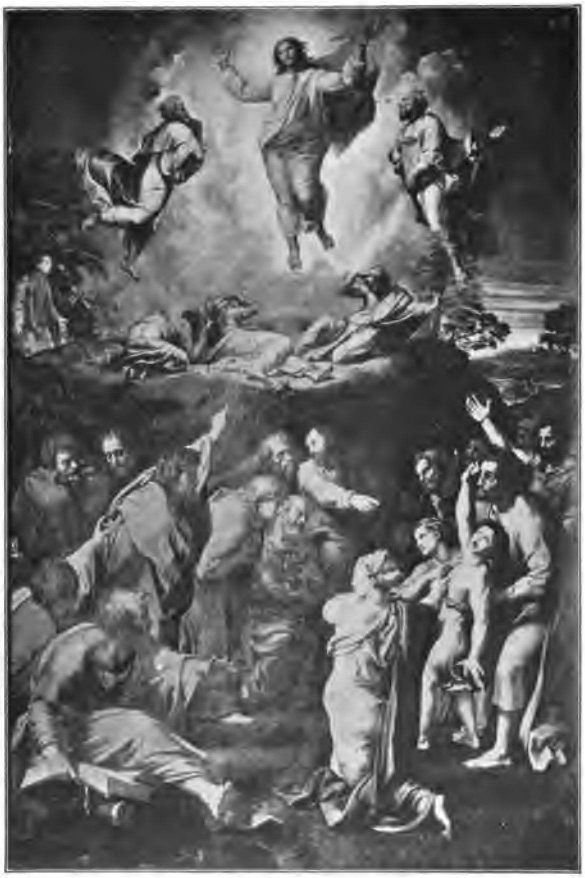


Fig. 57.
TRANSFIGURATION, RAPHAEL.
A composition of double primary masses below, and triple above.

would be possible to elaborate this still further by making similar diagrams for buildings of various types, vertical or horizontal, individual or continuous, in their tendency;

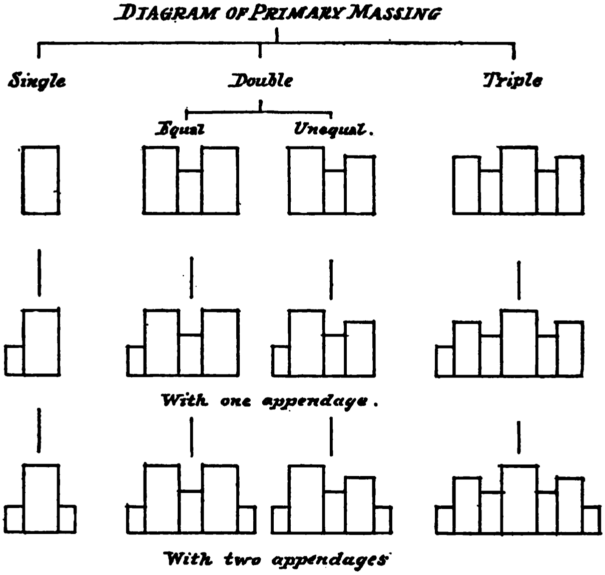


Fig. 58.

All buildings of any architectural pretension may be classed under one or the other of these diagrams.

and by subdividing the third variety, those with two appendages, into those with symmetrical, and those with asymmetrical appendages; but to carry the classification to such an extreme would darken counsel rather than illuminate.

IX

SECONDARY MASSES

IN the use of secondary masses the body of the building is always given, upon which, as upon a background, the composition is to be constructed with secondary masses aptly disposed.

If they are really aptly disposed, we may convert a plain box of a building into a perfectly satisfactory composition; but it will not do to stick on "things" here and there promiscuously: it must be done *secundum artem.* It will not do at all to put a piazza on the north and west sides so as to have shade all the time, and a round tower on the corner, because Mr. Jones has one, and a diagonal bay window on another, to command the distant view, which is best on the southeast, and mansards and tower roofs of opposite curvature, for variety, and a miscellaneous collection of windows of assorted shapes and sizes, for no particular reason but general deviltry, Fig. 59. On the contrary, the secondary parts must be applied with careful attention to number, size, shape, and dimensions.

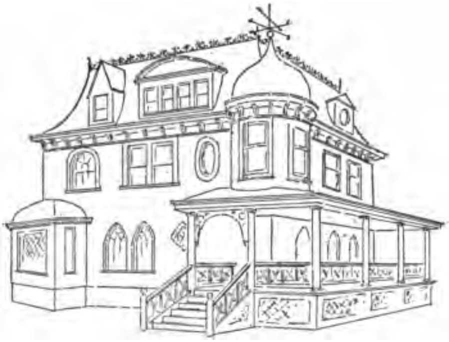


Fig. 59.
Secondary masses placed upon a building regardless of rules.

The house shown in Fig. 60, for instance, began with a plain box, to which the conditions made it necessary to adhere. The oriel windows each side of the second story were at first intended to start from the ground as bay windows through both stories. Considerations of proportion confined them to the second story, in order that they might show as horizontal rectangles, approximating that of the whole front.

They are not required for use, as they command no view, nor do they enlarge the rooms, as they do not come low enough to permit the second story floor to extend into them; they are put on solely for ornament. The veranda was made octagonal because the oriel windows were octagonal, and its roof was octagonally hipped as were those of the oriels. It was not carried around three sides nor two sides of the house, nor even along the whole front, because it was needed to make the third of a group of three with the two oriels.

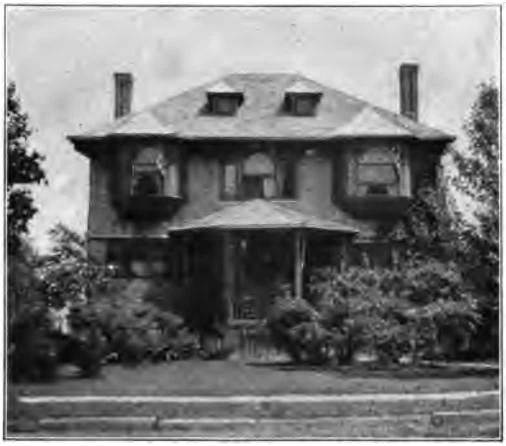


Fig. 60.

A plain rectangular house, adorned with three secondary masses, the oriel windows and the veranda.

The main roof was studied for a long time, as the owner was anxious to have more room in the garret, but in the end gables were discarded and the roof was hipped to make it harmonize by similarity with those of the oriels and veranda.

A further effort was made to enlarge the little dormers, and to make them octagonal also, but it could not be done. They had to be subordinated to the twin oriels, the main motive, and any enlargement caused them to compete in size with the latter.

The result was most satisfactory to all, as the owner was quite content to put up with the loss of space in the garret, in consideration of the general approval of the external appearance. It is a mistake to suppose that beauty can always be attained without cost or sacrifice. It may be noted that this was the first design made with a conscious application of the laws of composition as now unfolded.

In this way secondary masses are to be used, by applying them to the primary mass or masses, which would be complete, however, without them. Thus used they may be applied to any parts of the first order, that is, to the primary masses, or to the links that connect, or the appendages that extend them.

Corresponding with the individuality and unity that inheres in a single primary mass, is the sense of unity in the whole composition that is given by the application of a single secondary mass.

Whether it be portico, or porch, or turret, or bay, or oriel, or dormer; whether planted on in the centre, or asymmetrically on one side of the centre, or on an angle, the power of such a single object to give unity is attested by its general prevalence. The most usual and well-worn type is naturally the central portico, as in Fig. 36. Of course a perfectly symmetrical arrangement, and some kind of central projection of porch or portico, is frequent and excellent. Of deliberate asymmetry a conspicuous instance is the tower of the Palazzo Vecchio at Florence (Fig. 106). The appearance of this has been injured by the upper belfry, added at a later period with the apparent intention of making the tower the primary mass, while its original designer evidently meant to subordinate it. Single subordinate objects asymmetrically placed were a favorite motive of Richardson, as seen in the library, Fig. 61, in which the gable is a secondary mass compared with the building, and the low turret is still more subordinated and is attached to the gable. This is an interesting instance of the use of single secondary masses asymmetrically placed; and also one of the infrequent cases in which a third order of masses occurs, a secondary mass bearing one still further subordinated.

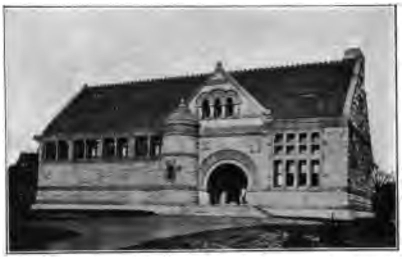


Fig. 61.
LIBRARY AT QUINCY, MASS.

The gable is a secondary mass, asymmetrically placed. The tower is a tertiary mass placed asymmetrically upon the gable.

In the same way may two secondary masses be applied to a primary part.

We have already shown how the two oriels are applied in Fig. 60. Here is an example (Fig. 62) of two turrets, similarly applied; in this case to the angles, and not to the flat front, with a single dormer upon the latter. Another turret is applied to the appendages as a single asymmetrically placed secondary mass.

At Fig. 63 is a striking instance of the use of two asymmetrical secondary masses, although they are applied symmetrically. Observe that, in spite of the difference in size, the similarity of character is maintained.

Here again a single secondary oriel is placed asymmetrically upon the front of the primary mass.

Very often in the case of a central link between double primary masses, one or more secondary masses are placed upon the link as is the porch upon the first story, and the twin dormers upon the roof in Fig. 35*d*; but it is important in such cases that the secondary masses be kept very much smaller than the primary, in order that their subordinate character may be evident.

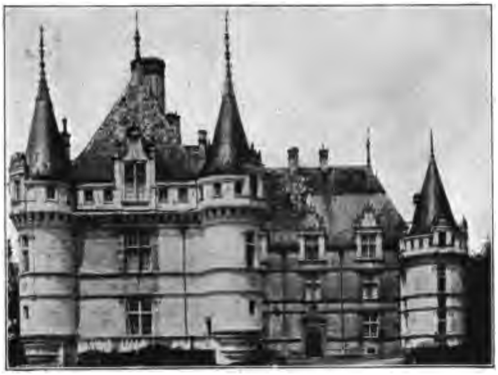


Fig. 62.
CHATEAU D'AZAY-LE-RIDEAU.

Two secondary masses upon the primary mass, and a single secondary mass upon the appendage.

It is quite usual, too, to place the entrance, with its porch or portico, upon the central link between a double mass motive; but this is not essential, as the composition will hold together quite as well if the secondary mass, including the entrance, is upon one of the primary masses.

Returning to Fig. 62, we have in the third turret a case of frequent occurrence in which a secondary mass is placed at the termination of the appendage. The same thing is often done when there are two appendages, similar secondary masses being placed upon each, and the effect is peculiarly graceful when they are placed upon the primary mass also, as is here done.

So far the use of secondary masses is entirely analogous to that of primary masses, either single or double, and of the latter, either equal or unequal being available for use upon any part of the composition, and giving unity of effect to the whole, and individuality to the primary masses.

When we come to three secondary masses we find their use much the same as that of three primary, the central one being in many cases the largest, as seen in the three dormers upon the central link in Fig. 145. Contrary to the rule in primary massing, however, this is not always the case, as three secondary masses of equal size may be freely used.

Examples of three dormers, three bays, and so on, of equal size are frequent; an example is given in Fig. 135, and in Fig. 64 a more notable case is shown. In this the three bays, crowned with fantastic gables, are of the largest size possible for secondary masses, just equalling in height the house itself. Note, nevertheless, that the ridge line of the house does run

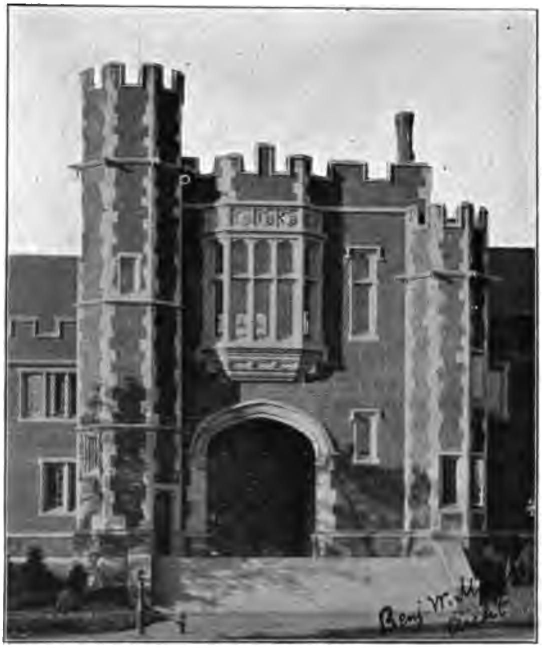


Fig. 63.
DORMITORY, PRINCETON.
The turrets constitute two asymmetrical secondary masses.

through, appearing as a very much fore-shortened gable at the right of the right-hand bay. It would make a more coherent design if the ridges of the gables were somewhat lower with reference to the main ridge. It may seem like splitting hairs to insist on a very minute point like this in classifying masses as primary or secondary, and indeed it would be so, were it not that it is just this question of where to place the limit that so often is to be answered.

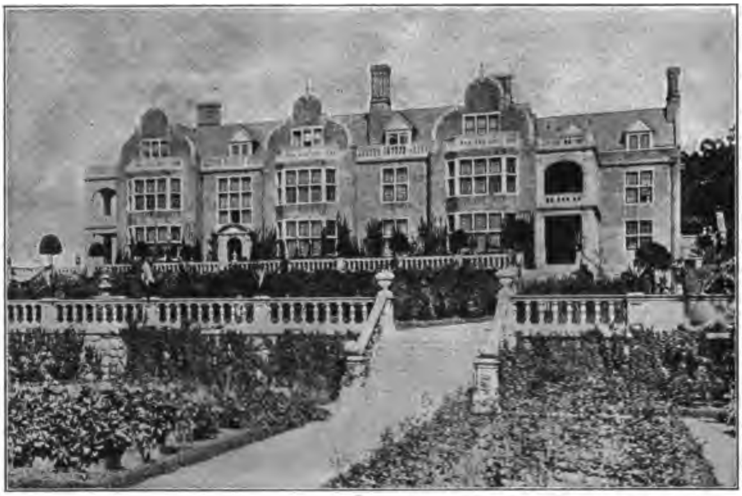


Fig. 64.

HOUSE OF H. W. POOR, ESQ., TUXEDO, NEW YORK.

The three gabled roofs are of the extreme limit of size for secondary masses.

It is true that the difference of effect where the ridge of the front gable is four inches below that of the broadside roof beyond, and *vice versa*, is infinitesimal, but if we bear clearly in mind that the point where the ridges are of equal height marks the point where the front gables cease to be secondary masses and become primary, we have a key to the situation that enables us to modify our design to suit the circumstances, should we be called upon to change the relations in the height of the gables in either direction.

This illustration shows the limit at which secondary masses can be considered secondary and treated as such. Drop the horizontal ridge several feet, and the three gables will stand up against the sky as primary masses instead of secondary, and the need for increasing the size of the central one will at once be felt.

The reason why it is not felt, while the front gables remain subordinate as secondary masses, appears to be that the dominant mass of the house forming a background holds them together, the straight horizontal ridge possessing unity of continuity enough in itself to connect all of the smaller objects that may be placed in front of it.

When the ridges must be at the same level, as is the case here, it is possible to treat the three masses as primary, by stopping the main ridge at the ridges of the outside gables; or as secondary, by letting the main ridge run through, and those of the gables abut against it, as is here done.

It will be found more satisfactory to let either the main ridge or the ridges of the gables fairly and clearly overtop the other, enough to make the subordination plain, not only in the case of three, but of one or two secondary masses; indeed, the chief part of the art of composition lies in this definite selection and unfaltering carrying out of the chosen motive.

We now come to a new and totally different class of facts, upon which we have hitherto not touched, except by barest allusion; not at all certainly in the way of explanation.

We have just seen that the assemblage of three equal masses, which is unsatisfactory when the masses are primary, unless the central mass dominates, becomes practicable and pleasing when they are secondary, even though the central differs not at all from the others; we now note that the grouping of four or more masses, which is never used in the case of primary masses, is frequently used and always pleasing in the case of secondary masses.

Such a row of secondary masses, for instance, as that of the gables shown in Fig. 65, is pleasing in a very high degree. It is so, however, in quite a different way from the groups of lesser numbers that we have been considering. The sense of several objects forming an individual whole is lost. The eye no longer grasps the number of objects at a glance; the sense of individuality is gone.

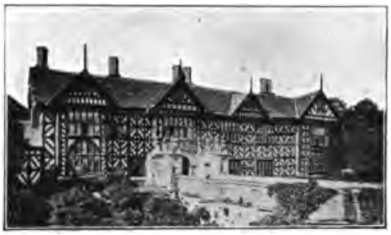


Fig. 65.
Four secondary masses, exhibiting the unity of continuity.

Yet, although individuality is gone, there is still unity, but of a different sort—the unity of continuity. It is now the impression not of one gable, nor of one gable flanked by one on each side, like an escutcheon flanked by its supporters, which is the fundamental impression where there are three, but of one building with one unbroken row of gables.

To realize what is meant put your finger over any intermediate one of the four, and you will at once see the peculiar shock of discontinuity in what should be a continuous series. It is just the same as the disfigurement that is caused by the loss of one tooth from a row.

And the illustration shows upon examination that the men of that day felt it and took steps to remedy it. Notice the gable next to that on the extreme right hand. It is the only one of the four that does not occur at a break in the plan. Besides that the other three are placed over wide, multiple windows, preventing the drip of the water from the eaves in front of them. This one is placed boldly over a pier, between two windows. Sufficient evidence surely that it was built for "looks" only; and if it is removed we have the sensation of one missing that is so fatal to a row of anything.

Take a single dentil out of a row of dentils, or a baluster from a balustrade, or an egg out of an egg-and-dart moulding, or a column out of a colonnade, and the same effect of stopping with a jerk will occur. This sense of satisfaction in an even row of things we call continuity, and distinguish it from the individuality which is its opposite.

To still further clear up this question, which is a fundamental one in architecture, let us take a row of three dormers instead of four. Cover any one of these and there will remain two which we know will hang together persistently as a pair, with no sense of a gap between them; and if from a pair one is removed we have, in the one that remains, the sense of unity and individuality that inheres in any single object.

It is only when the number of subordinate masses is four, or more than four, that a feeling of hiatus occurs when one of the intermediate members is removed.

This feeling of hiatus, or interruption, caused by a break in an even row of things, makes us perceive more clearly, what we had before taken as a matter of course, that an even, unbroken row does appeal to us as a united whole; that, although it is without the quality of individuality, and the unity that springs from individuality, it nevertheless has just as much unity, arising from totally opposite qualities.

Now these properties of number are closely allied to the forms of objects that we have before noted. The horizontal row is closely associated with the horizontal line, and is most appropriately, but not necessarily used in connection with horizontal disposition.

Look forward to Fig. 115, and observe that, while on both of the primary masses groups of three are used, topping out with single dormers, also upon the link in the three lower stories, in connection with the subordinate individual motive of the doorway, yet upon the appendage, that is, the whole rear part that is attached, four dormers, and four of everything is used, as well as upon the link when we get well up to the roof, and in close association with the horizontal line of the connecting ridge.

As the continuous row is intimately associated with the horizontal line, so is the individual group with the pyramidal outline that we have spoken of as the characteristic individual shape. Observe how naturally the group of three at *a*, Fig. 66, fits into the triangular gable, the tendency to make the central one of a group of three the largest having much in common with the pyramidal sentiment; while a single one (*b*) will do quite as well, two (*c*) not quite so well, and four (*d*) not at all.

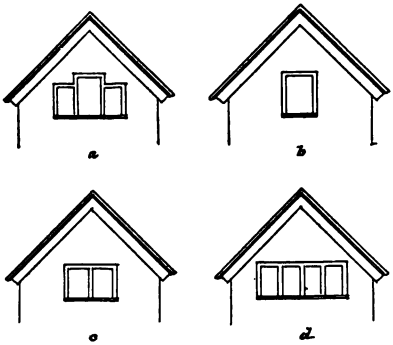


Fig. 66.

Adaptation of individual groups of details to primary mass of individual form.

We may also note that the reason why a moulding does not look well when cut off square, instead of being returned, is due to the sudden stoppage of continuity, a sense of sudden interruption, somewhat analogous to the feeling that is produced by a missing one in a row of objects.

Why it is that a continuous arrangement of primary masses cannot be used is not so apparent as the fact that it cannot. The reason would seem to be that a more conspicuous connection than any link that can be devised is needed to hold them together; or let us say that, when the link is made important enough for this office, it ceases to be a link and becomes the dominant mass, reducing what had before been primary masses to a secondary position when compared with itself. This is also true in the case of three primary masses of equal size, an arrangement which always calls for some predominance of the central mass to give the needed unity. In Fig. 65, and also in Fig. 64, imagine the roofs of the main buildings between the gables removed, so that the gables stood up stark against the sky, primary masses beyond all question, everything else being subordinated to them. The lack of unity, the feeling of dislocation which then occurs, comes from the lack of sufficient connection between them; and, if we again add the roofs, little by little, beginning with a low ridge and gradually raising it, we shall find that just where the roof begins to be sufficient to hold the gables together is the point where the ridges are at the same level.

In passing from primary masses to secondary masses and details, we find that less and less provision for a linking part is required. With primary masses a link is always required; with secondary masses, the connection that comes from the mass of the building behind them is usually sufficient, although at times a link of some sort may be used (an instance is shown in Fig. 67), in which the framed and shingled segmental balcony serves as a link to connect the two gables, while in the case of details no connecting part is required, but they may be placed anywhere and will be sufficiently connected by the preponderant primary and secondary masses upon which they occur.

The conclusion is that for both primary and secondary masses, either one, two, or three at a time may be used, with the unity that attaches to individuality, except that in the case of primary masses there must be some predominance in the size of the central mass when three are used. In the case of subordinate masses a very slight, quite unnoticeable, excess of size in the central mass gives a certain indefinable grace, and counteracts its tendency to seem smaller than the other two.

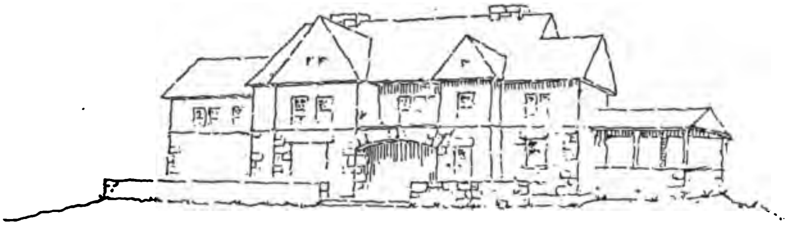


Fig. 67.

Two unequal secondary gables, connected by a flat arch, as well as by the mass of the house upon which they are placed.

But while more than three primary masses may not be used, four or more secondary masses or details begin an entirely new kind of harmony of number, and may be used in the proper place with perfect freedom.

X

DETAILS

THE word details is here used in its colloquial sense to designate such minor architectural objects as window and door openings, panels, niches, columns, arches, and the like, which may be applied to the masses of a building, whether primary or secondary, rather than in the more technical sense, in which it denotes still smaller parts, such as dentils, capitals, and brackets.

Using the word in its first sense it will be found that the number of details that should be used is governed by precisely the same laws as those of secondary masses. It will hardly be worth while to repeat the same things that we have said of secondary masses. A few instances will suffice.

In the first place, as in the case of secondary masses, a single detail properly placed will often be sufficient to give unity to a whole composition.

In Fig. 68 is shown a building of considerable size, of the horizontal continuous type in its composition, having from necessity, to all appearance, what is a rather unusual condition, two entrances of equal importance. Now two such objects without closer connection, and with their individuality strongly marked by pediments or otherwise, are apt to have an appearance of unnatural separation, a fault which is commonly known as "double composition." To avoid this the designer has placed a panel between them carved in low relief with a figure subject: the effect of this in "pulling together" the whole building is remarkable.

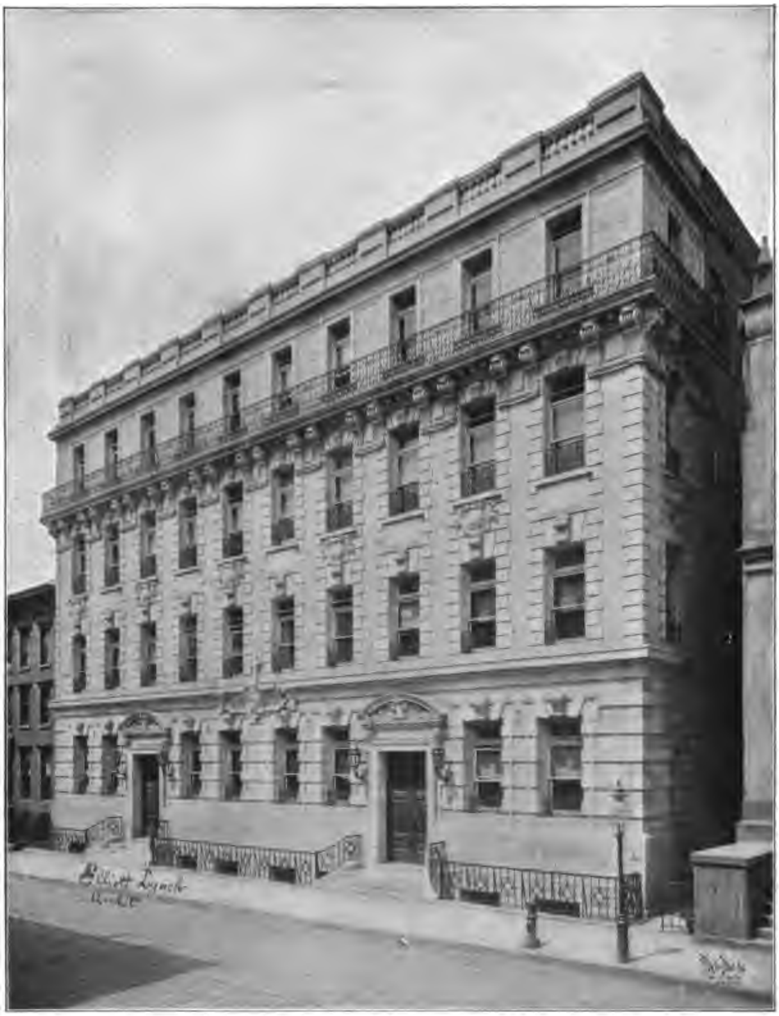


Fig. 68.

St. Stephen's Parish School, New York.

The carved panel forms a point of concentration, and gives unity to the whole.

Another instance is found in the doorway and the escutcheon above it of the Farnese palace, Fig. 108, although there are no antagonistic twin doorways to be harmonized; and examples abound everywhere of a central doorway as the single detail that unites a whole front.

In most compositions of two primary masses, whether they are equal or unequal, a single object, either a secondary mass or a detail, is placed upon the link between them, usually, although not necessarily, at the centre.

Thus, in Fig. 69, the panel over the central archway, as well as the archway itself, gives a sense of unity to the whole front.

As in the case of secondary masses, details either singly, or in groups of two or three, that is to say, in all combinations that possess individuality instead of continuity, are naturally and appropriately used upon the parts of a building which themselves possess individuality, that is to say, upon the primary masses and secondary masses.

Turn back to Fig. 52, and in three of the illustrations, *a*, *b*, and *c*, the pavilions have three windows in each story, and the same is true of the example at Fig. 51; while at Fig. 35, *c*, there are two windows on each story.

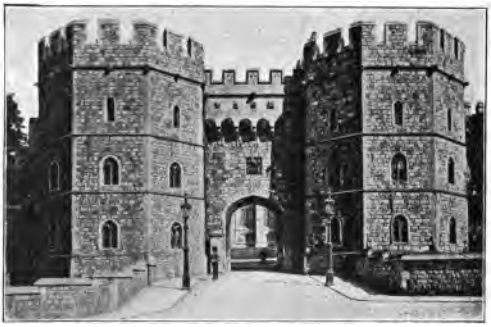


Fig. 69.

Unifying effect of single details, the archway and the panel above it.

It is essential, if two are used, that they should be alike in design; and if three, either that all should be alike, or the two outside alike and the central one different.

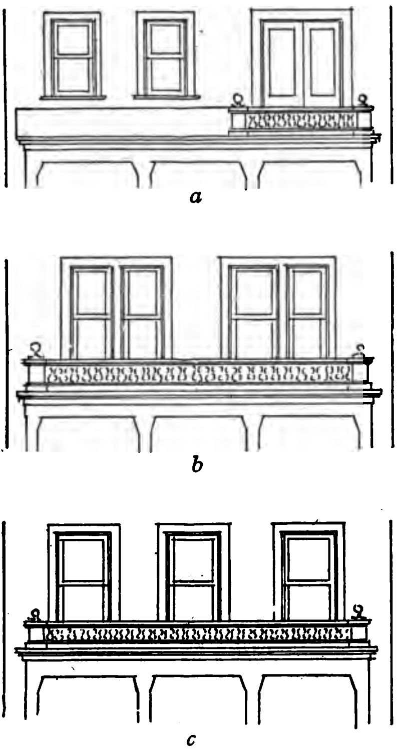


Fig. 70.
a. Improper, *b* and *c*, proper treatment of details.

This means that if the first draft of the plan indicates something like *a*, Fig. 70, a pair of doors opening from a hall upon a balcony on one side, and two windows in a room on the other side, such a combination is not allowable.

If door there must be, the two windows must be put together, and a pair of doors substituted for the single one, matching the double window in general appearance, the stiles of the doors diminished as nearly as possible to the width of those of the windows and a group constructed of two like objects instead of three unlike, as at *b*; or the three may be retained and the doorway made single, both door and windows otherwise being alike, as at *c*.

The arrangement of city house fronts, with the doorway on one side, is so familiar that we have lost sense of its ugliness. Once in a while a similar case occurs in a second story, as in this case, or some other unusual place, when its awkwardness becomes striking.

Passing from definite and individual numbers, which cannot exceed three, we find the same results with four or more details as in the case of secondary masses; only in a greater degree, because, while it is seldom possible to put more than four secondary masses upon a building, on account of the limits that we must set to its total dimensions, it is possible to put on details by the dozen or score.

Now, just as the individual groupings of one, two, or three details are naturally associated with the vertical, individual parts of a composition, so the continuous succession of four or more is associated with the horizontal line, and the connecting parts of the composition.

This is illustrated, too, in the minor details, using the word technically, which are subject to the same rules of composition as the building itself.

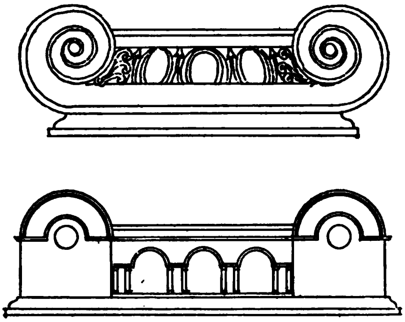


Fig. 71.

Analogy of composition between an Ionic capital, and two primary masses, connected by an arcade as a link.

In an Ionic capital, as an illustration, the egg-and-tongue moulding and the horizontal lines of the bead and abacus perform precisely the same function in connecting the two volutes and eyes as is performed by the arcade in connecting the two pavilions in Fig. 35, *c*.

Indeed, if we turn the capital upside down we convert it into a sort of crude resemblance of a double primary mass building, by those changes only that are needed to make it a stable construction and to adapt it to its uses, as at Fig. 71, which, rough and impossible as it is, clearly shows the analogy between the continuity of the connecting objects, the eggs and darts in one case, the arches and columns in the other, and their association with horizontal lines.

This association with horizontal lines seems to be essential to the full effect of continuous numbers of objects, whether secondary masses or details. Not only do we think of a row of objects as a horizontal line in itself, but, without some actual horizontal line, the row of objects remains dislocated, as a plurality of separate things, not as one row of many units.

Half a dozen columns remain half a dozen columns, each asserting its separate individuality almost as much as if there were only two or three, as long as no entablature is placed above them, Fig. 72, *b*. It is only when the horizontal lines of cornice and stylobate are added that we entirely lose sight of the separate entity of each and conceive the whole as a single colonnade, as at *a*.

The characteristic of such a succession is its even and unbroken continuity.

A noticeable difference in the spacing of the objects, columns, windows, or whatever they may be, or a noticeable variation in the design of one of them, still more the omission of one, breaks in upon the smoothness of the series and produces an unpleasing result. It is for this reason that coupled columns are to be avoided except in an even series of couples. If used in single pairs at the ends of the colonnade, or if interpolated in a series of single columns, the result is apt to be unsatisfactory. For the same reason the use of three columns at an angle in a colonnade of coupled columns is to be avoided.

Whatever the objects may be, uniformity of succession, where that is the quality sought, must be unbroken.

In Egyptian work the long lines of painted and incised figures, all of exactly the same shape, all marching in exactly the same attitude, were not merely pictorial, they performed a part in the decoration analogous to that of the columns, metopes, and carved mouldings in Greek architecture. Indeed, it is very much the same sense that is appealed to in the ordered alignment and marching of a column of soldiers to-day.

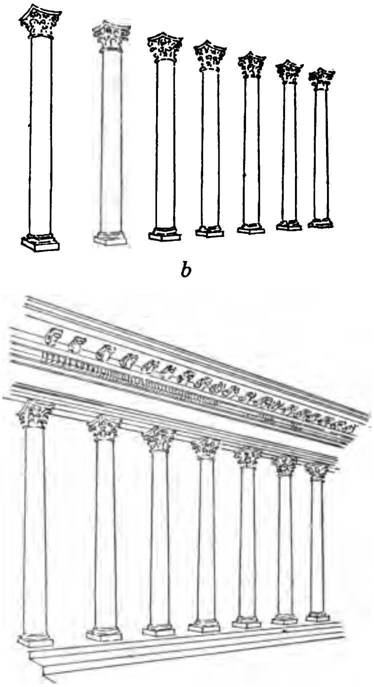


Fig. 72.
Enhanced continuity given to a row of columns by the addition of continuous horizontal lines.

The converse also is true. As horizontal lines added to a continuous succession of objects gives unity to them, so a horizontal line, which by itself lacks unity, receives this quality when a succession of objects is added to it.

The primary masses of a building, as we have seen, may in their skyline be either pyramidal or horizontal.

If they are the latter it becomes almost essential to confirm their continuity by placing a succession of brackets, mutules, dentils, or other objects upon them. This is the reason that in the classical styles, whose keynote is the horizontal succession, such decorations are used; while in the Gothic styles, using the term broadly, where gables and spires mark the individual parts, anything but a sparse ball flower is unusual; nothing certainly to compare with the consoled and mutuled cornice of the classic.

For the same reason all interruptions of a horizontal line and of a succession of objects are dangerous, unless we are prepared to deal with the parts into which we split it up as separate individuals. Thus in the treatment of cornice shown in Fig. 73, we almost lose sight of the horizontal feeling and naturally separate it into a group of three shelves, each with a pair of consoles.

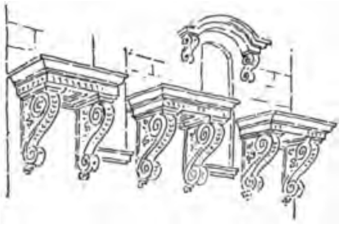


Fig. 73.
Disastrous effect of interrupted continuity.

Continuous rows of details may be made to serve very well in place of a strong horizontal line, where other considerations forbid us to make our cornice as heavy as we might like. Such is the function of crenellations in buildings where there is no military occasion for them, and that of the crowning balustrade in many a modern building. Often again a whole upper story is treated as an attic, but is cut up with pilasters and finials, the cornice below not being sufficient to unify the mass of the building beneath it.

The whole question of continuous ornament has wide limits. Extending it for a moment to the field of flat design, or design in general, we find it a very marked character of all kinds of borders, in connection with straight lines, not limited in this case to horizontal. It is probable, too, that it is closely connected psychologically with the surface designs called powdering and diapering, in which the continuity is superficial rather than linear. Take the pattern commonly called the polka dot, an even arrangement of circles of one color on a ground of another. The circles in themselves are not sufficiently beautiful to account for the pleasure generally felt in this pattern, nor is the beauty of the color the cause, as, in this, nothing is more generally satisfactory than the plainest black and white. It appears to be nothing but the even succession in all directions of things exactly alike that is the source of gratification.

In architecture, however, the use of continuous ornament, or arrangement, in a vertical direction is limited by the possibilities of materials, and by the continual intrusion of the intellectual questions of construction and utility upon the pure sentiment of beauty with which the æsthetic sense theoretically must deal. We cannot spot a white wall with circular polka-dot windows arranged quincunx fashion.

Two principal rules may be laid down for the architectural use of details in number four or more, that is to say, continuously.

In the first place, when the treatment is horizontal, and the horizontal dimensions of the front exceed the vertical, and there is no need for breaking up the front into pavilions, and a plain straight skyline seems the natural thing, in such case the even succession of windows, as in the Farnese, and many other Italian palaces, is the proper and inevitable treatment. When a continuous treatment has been adopted, refrain from breaking up the regularity of the succession on pretense of fortifying the abutments as in Fig. 74, or any other plea of constructional necessity, as such devices no effort of the unsupported intellect can excuse.

In the second place, where a flat front and straight skyline are not available; where the design must be divided into primary masses, one, two, or three, with their essential links and possible appendages, the proper place for the continuous treatment is upon the links or appendages, and not upon the masses, although where the masses are of a strongly marked horizontal character and the level cornice is carried through, it is possible to give them also a continuous treatment, in the disposition of the details as in this illustration (Fig. 75), of the garden front of the Pitti palace, in which each of the two masses has five openings in each story.

The great difficulty about architectural design is the fact that there can be no single solution for a given arrangement. The ways of doing things are many, all good if properly done; but as, when a certain change is made, others become necessary, the problem is how to make such simultaneous modifications in all other parts as shall secure a harmonious whole as the result.

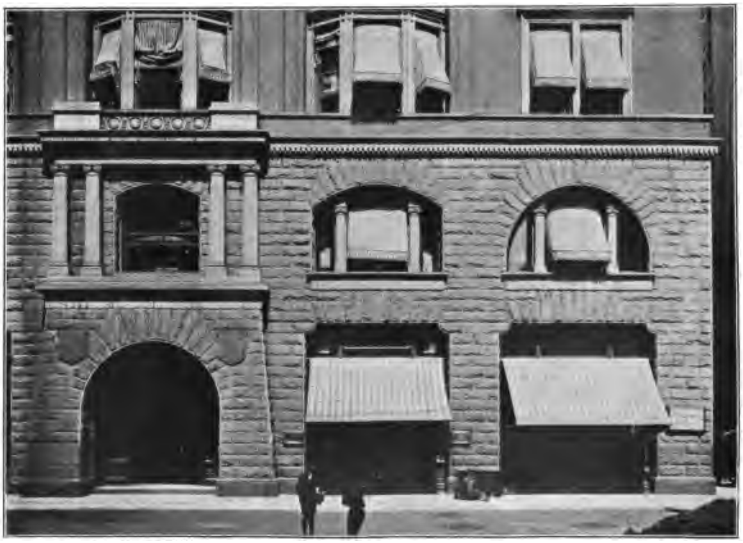


Fig. 74.
The change from segmental to semicircular arches destroys the continuity.

Fig. 115 is an admirable specimen of the appropriate use of individual groups of details, and also of continuous arrangements of them. On each of the two pavilions with their high peaked roofs and marked individuality the windows are placed in groups of three, terminating above in a single window; the link also has three, as a central doorway was required, not only for utility, but as a single unifying detail; nevertheless, immediately below the horizontal roof line of the link is a row of four dormers, very much adding to the unifying effect of that line.

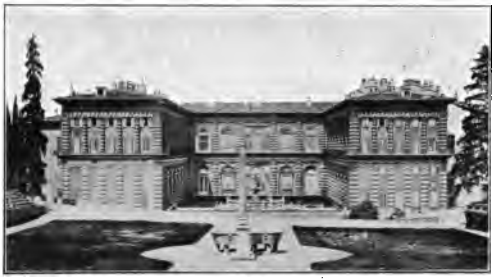


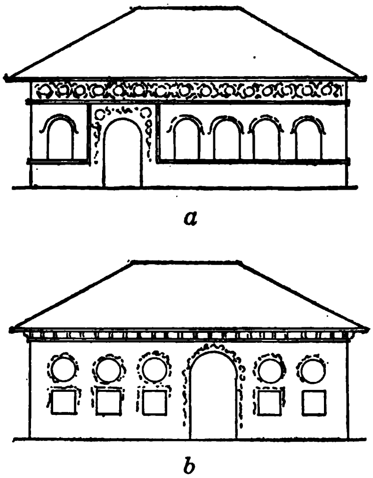
Fig. 75.
Pitti Palace.
The masses, as well as the link, are treated continuously.

Upon the appendage the windows are placed in rows of four, denying individuality to this and concentrating it entirely in the two primary masses. Notice, in passing, how carefully the roof line of the appendage is subordinated. Not only is it made much lower, as is proper, but the very cresting upon it is smaller than that upon the ridge of the link.

That the mediæval architects realized the importance of the continuous horizontal line in the link, as well as the difficulty they encountered in reconciling it with the vertical gable, is seen in many church fronts, as at Paris (Fig. 102), in which the horizontal arcade quite masks the gable, at Amiens, where the gable is only partly obscured, and at Tours, where they contend for supremacy.

Finally, it is possible, by suitable arrangements of details, both individual and continuous, to delineate, so to speak, upon a flat wall whatever composition, analogous to those of mass, link, and appendage, may best suit the matter in hand.

The most available details for the purpose are the windows and doors which are essential parts of most modern structures, and these may be disposed in an endless variety of combinations, that particular motive being chosen which best suits the internal requirements.


a

b

Fig. 76.

Disposition of details suggesting a single mass with two asymmetrical appendages.

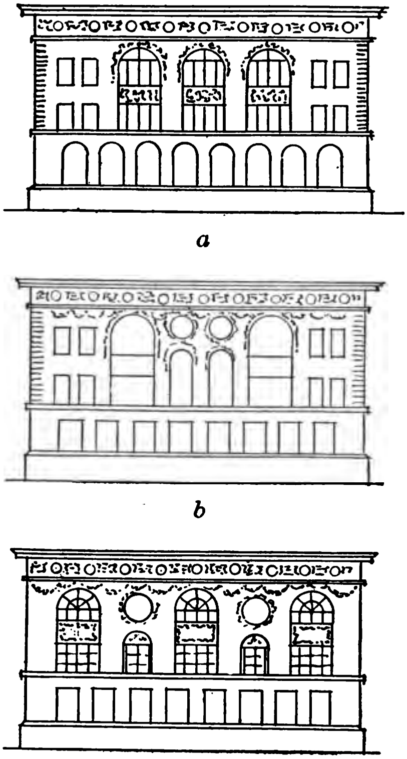
Figs. 76–79 are a series of diagrams suggesting the sort of thing that may be done. The first (Fig. 76, *a*) corresponds to a single primary mass, with two asymmetrical appendages. The doorway, which may be enriched in such style as will match the rest of the ornament, constitutes the single object; while the windows on each side take the place of the appendages. Above, the row of bull's-eyes, either with or without connecting enrichments, forms a continuous line, which, together with the cornice, connects the whole.

At *b* is the same motive slightly modified. The frieze of bull's-eyes is abolished and only the doorway and windows remain, suggesting as before a mass with appendages. Such a use of a single preponderant detail may be made just as effective, and may conduce just as much to the unity of the whole composition when placed asymmetrically, as in both of these sketches, as if it were duly centred, perhaps at the sacrifice of important requirements of utility.

An arrangement of three large windows is shown at Fig. 77, *a*, corresponding with the three secondary masses in Fig. 64. The smaller windows on each side of the main group in a case of this kind must be ignored as much as possible; very often the composition would be improved if they could be omitted entirely. Where that is not practicable, it is always possible, by making the reveals slight and the treatment bald, to render them almost unnoticeable in the general scheme.

A modification is at *b*, in which the triple motive has become a double one, the two smaller arched windows serving as a connecting link. This use of smaller objects as links between the larger details that constitute the group, is a characteristic of the treatment of details, and of great utility in practical work.

Another instance is at *c*, in which the three large windows of *a* are connected by smaller windows between.



a

b

c

Fig. 77.

Disposition of details suggesting double and triple secondary masses.

At Fig. 78, *a*, is a simple one-story building, the two large windows forming a double group. The four smaller windows between constitute the link and the two external stand in place of appendages. The whole corresponds to such a composition of primary masses as that at *b*, in which the matching of the parts, each to each, is indicated.

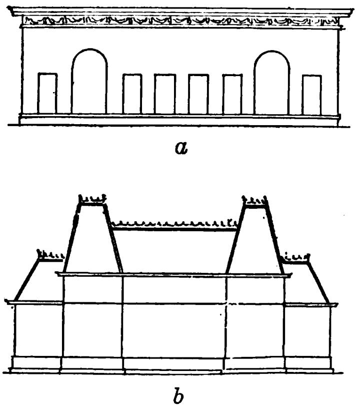


Fig. 78.

Analogy between arrangement of details in *a* and primary parts in *b*.

An entirely different type of building is shown at Fig. 79. This is the many-storied building of modern times. It is here treated by combining the window openings in four stories into two large arched openings, which it seems anomalous to call details, and yet they certainly are not masses in any sense.

Whatever we choose to call them, it is a composition of two objects, the smaller windows in the central and flanking piers being ignored entirely, and suppressed as much as possible. In the two lower and the two upper stories the openings are thrown together as continuous rows, in harmony with the horizontal treatment of the building.

Another class of details consists of those that are used to divide the parts of a building into minor parts by means of vertical lines; such as buttresses, pilasters, vertical lines of quoin stones—chainages, as the French call them—and similar devices.

Inasmuch as these are virtually lines of separation between parts, it is the parts which count in the composition rather than the lines. By means of such details any wall surface may be cut up into three parts where individual treatment is required, and these may be all of equal size, as shown in Fig. 51, in which each story of each pavilion is thus divided by pilasters, or into more than three parts when continuity rather than individuality is sought. It is noteworthy that a wall which is divided into two parts by vertical details does not give the unity which usually inheres in a combination of two objects, for the reason that a vertical line appears as a division rather than a connection, and such an arrangement can be used only where continuity is sought and there is not room for four divisions of the surface. This appears in the same illustration (Fig. 51) in the division of the links into two parts. In similar situations a division into two parts possesses a stronger effect of continuity than a single part or three parts, and is to be preferred if more than three cannot be compassed.

Vertical details are often used to accentuate the outlines of masses whether primary or secondary, as the buttresses at the angles of a Gothic tower, which are not required constructively; or the pilasters, single or coupled, at the angles of a pavilion, in much the same way that a cornice is used to outline the top, or a water table the base of the building. In the same way chainages

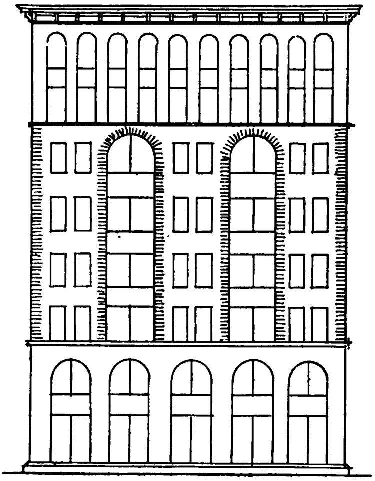


Fig. 79.

Disposition of details to suggest a composition of two secondary masses.

of quoins are often used at the angles of a building or of its principal divisions.

Sometimes a compound subdivision is made by means of such details, as in Fig. 11, in which each story is divided unequally into three parts by coupled columns, and the middle one of these is again divided into three by single columns.

For continuous treatment, too, vertical details, such as columns or pilasters, are frequent; in which use they are subject to the same rule as other continuously arranged objects, that the series must be even and unbroken; and this applies even more forcibly to these than to details of other character, for whereas the latter often seem to almost spontaneously group themselves when irregularly placed, any noticeable irregularity in the spaces into which walls are continuously divided by vertical details is sure to be unpleasing.

Nor can any attempt at asymmetrical division be made with such details. The division into two parts must be into two equal parts; and that into three parts must at least have the two outer parts equal to each other.

Disregard of this rule is frequently to be observed where the principal but lesser front of a building is divided into three parts by quoins, and an equal space is cut off on the return by a like line of quoin-stones, leaving the rest of the long side undivided, with a very unsatisfactory result.

XI

HORIZONTAL DIVISION

WE have spoken so far of the various parts of buildings formed by vertical lines of separation.

Masses and links and appendages are distinguished either by a difference in projection, which means a vertical line of shadow, or by a difference in height, which means a vertical line at the point where the difference in height occurs, or by both. They are also subdivided by means of pilasters, buttresses, engaged columns, and such other devices for obtaining vertical lines, as described in the preceding chapter.

Whatever be the sort of building under consideration, whether a simple four-walled inclosure, or a highly complex assemblage of parts of the first order, it is almost always cut up into horizontal parts in one way or another.

There are two ways in which a building may be so divided, which are strictly analogous to the ways in which it may be divided into parts vertically, but of inverse importance.

The first is by the advance and retreat of different parts, that is, by either setting back or by overhanging the upper stories, producing either a shadow or a line in construction; the second by the delineation upon the surface of the front of lines of demarcation, at the points where they are required.

The first way is exemplified in such towers and spires as are built in gradually diminishing stages, also by porticoes, aisles, verandas, or arcades, that advance in front, as does the narthex of St. Mark's at Venice. A similar scheme was carried out on a large scale in the pyramidal buildings of many stories, each setting back from that next below, which were built in early times by the Assyrians and Mexicans. This method is little used now because of the very small effect which is obtained, at great expense of construction, and serious loss of space internally. The effect, too, of a line obtained by retreat of the part above is almost nothing, except where the gradually tapering silhouette of the outline can be seen. This can only occur in a tower, for in an extended front the profiles are too far apart to be grasped by the eye in one picture, while upon the face of the front, the retreat of the upper part produces no strong shadow, and is barely noticeable except by its bad effect in foreshortening and cutting off the superstructure in any near view. Architects are familiar with the difficulty of handling the veranda of a country house, when it extends along the whole front, and are justly inclined either to shorten it, so that it may appear as a secondary mass, or to reduce it to a loggia, or to dispose it at the end of the front, where it may take its place as an appendage.

Add to this, that any retreat of the upper walls means an almost impossible cutting up of the plan below by the unavoidable continuation of the upper walls downward through the first story to a firm foundation, and the reasons are seen to be ample why this way of making horizontal divisions is not much used.

As for advancing the upper part, so as to cast a heavy shadow, no doubt this would be most effective; but here again, even more forcibly, constructional difficulties forbid. It is impossible to support an overhanging wall of masonry if the overhang is more than trifling. Where overhanging stories have been built they have been of timber construction, supported by projecting timbers, upon which it would be manifestly impossible to carry a heavy wall. Nevertheless the effect of the overhang where it exists is admirable, and if such overhanging structures were generally available the method would no doubt more than justify itself artistically.

It is possible that with modern engineering construction of steel such designs, whether with overhanging or retreating stories, may become practicable in stone or brick, as the weight of these is unimportant where metal supports can be had.

For the present, however, we may confine ourselves to the other method of obtaining horizontal division by drawing lines upon the surface.

The ordinary method of drawing horizontal lines in architecture is by means of mouldings.

Hitherto mouldings have been talked about and written about chiefly from a constructional point of view, and they who regard correct construction as the one essential of good design have thought it necessary to justify the existence of every stringcourse by some supposed utility, and have freely denounced the useless cornices of classically derived styles.

No doubt where an external offset in a wall occurs, a stringcourse is an admirable expedient to prevent the irregular weather-staining of the surface below, and the decay of the wall from the absorption of water at the horizontal shelf which would naturally occur. Artistically, however, we have nothing to do with such considerations, except to refrain from building anything that raises a question in the mind as to its stability, an intellectual doubt, which, although quite unrelated, might overshadow any æsthetic pleasure.

It is fortunate that on one point artistic and constructional requirements coincide, that is, upon the desirability of an "undercut" moulding for either stringcourse or cornice.

Constructionally the "undercut" is quite essential to properly shed the water, and the excellent results from its use, and distressing appearance owing to neglect of it, are matters of daily observation.

Artistically the undercut is quite as necessary, as the only way of intensifying the shade which it is the object of the moulding to produce.

For, from a designer's standpoint, a moulding is but a means of drawing a black brush mark across the face of the wall. From the eighth-of-an-inch arris upon a fillet, which is felt rather than seen, to the eight-foot cornice projection of an Italian palace, all are but the charcoal streaks with which we draw our design. Sometimes indeed the streak is narrow, dark, and uninterrupted; sometimes it is lighted up by speckled enrichment, sparkling in full light, or glowing in the half gloom of the shade.

Or it may be that we draw our line as a band of enrichment only, as frieze or dado, either alone, or in connection with mouldings or cornice, which intensify the effect.

Whatever enrichment is used it is most effective in such situations if it includes the element of repetition, which as we have seen gives the impression of uninterrupted continuity, and is inseparably connected with the horizontal motive. Thus the dentils, mutules, and modillions of the classic, the dogtooth and billet of the round arched and the ball flower of the Gothic styles were used.

Observe, too, that the more perfectly developed the horizontal motive in a style, the more clearly the repetition of the continuous ornament is marked in its enriched mouldings, and in addition, the more distinctly are the lines of the enrichment perpendicular to the horizontal line of the moulding. Thus in the Greek, the most perfect development of the horizontal treatment, we have in the Doric the vertical lines of the triglyphs in regular recurrence, forming a band of continuous enrichment entirely analogous to the vertical lines used in the enrichment of mouldings. Of mouldings proper, the dentil, the egg and tongue, the bead and reel, the line enrichment of the bird's beak, the fret, almost everything in fact, in the earlier Greek styles, is characterized by vertical lines. As the naturalistic idea is introduced with the development of the Corinthian capital, the meander, the rope moulding, the laurel leaf torus, and others, constructed on lines that are not vertical, become more frequent, until, in the Gothic, with a strong tendency to plain mouldings entirely, such continuous decoration as is found consists of wavy lines with recurrent leafage, and with but few lines perpendicular to the moulding anywhere.

Sometimes, when a moulding cannot be used, or cannot be made heavy enough for the desired effect, the band of successive objects may take its place, in part or entirely. Such recurrent objects are the military, or quasi-military, machicolations of the Gothic, the swallow-tail crenellations of the Venetian, the anthemion crestings of the horizontal styles, and all balustrades upon the face of a building. Sometimes even a line of windows may play its part as a horizontal line in the composition, especially when, in attic or mezzanine, they can be reduced to bull's-eyes, and tied together by enrichment of the surface between.

In our modern buildings of excessive height, whole stories, with cornices above and below, complete compositions in themselves, are often used as mere lines, to separate the basement of four or five stories from the shaft of ten or twelve, or the shaft from the superstructure of six or seven stories.

Whatever be the motive adopted, whether a vertical one, with a tendency to tall and comparatively narrow masses, and a general accentuation of heavy vertical lines, or the opposite horizontal motive, with the masses broad, flat, and level, there will be necessarily some lines, both horizontal and vertical, in the composition. It must be borne in mind that one or the other set of lines must predominate. A heavy cornice breaking around many deep projections is to be avoided, as well as strong vertical lines in connection with a design whose leading motive is its marked horizontal crown.

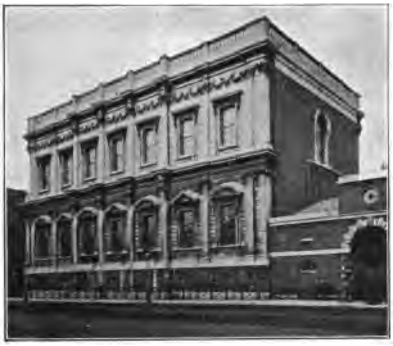


Fig. 80.
Banqueting Hall, Whitehall.
Horizontal subdivision into two equal parts.

Of the former error the west front of Westminster Abbey is a notable instance, in which the classic proclivities of Wren induced him to build semiclassic cornices upon a Gothic front.

The most frequent use of horizontal mouldings is naturally for the cornice and base of the building. Whatever be the style, some kind of moulding, whether the heavy classical shelf, or the simple terminal stringcourse, seems to be needed at the top of the vertical wall; while a base of some sort, in the form of steps, or the moulded dado, of greater or less height, is almost as universal.

Between these the wall surface itself may be cut up by mouldings in various ways.

Most frequent is the division into two substantially equal parts. Here is a typical example (Fig. 80). Another instance is the familiar library of St. Mark, at Venice, and very many other buildings are arranged in this way. There are others in which one part or the other predominates so slightly that the impression is that of general equality of height, although the importance of one or the other may be accentuated by the enrichment. An example is given at Fig. 81.

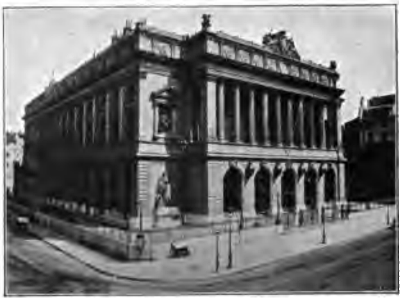


Fig. 81.
BOURSE, MARSEILLES.
Horizontal subdivision into two nearly equal parts.

Besides these there are innumerable specimens in which the division is into two parts, of which one or the other predominates so much that its excess in height is manifest or conspicuous. Sometimes it is the basement that is subordinate, with a considerably higher main story above, as in Fig. 82, and this is frequently carried to extremes, especially in buildings of the vertical type, where the horizontal basement, marked by a not too prominent line of moulding, seems to bind the whole together, when any additional lines nearer to the top might antagonize the general vertical tendency.

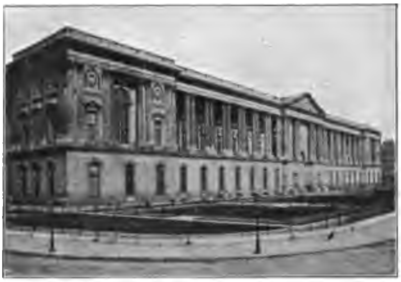


Fig. 82.
LOUVRE, PARIS.
Horizontal division into two unequal parts, of which the upper is greater.

The opposite way of using unequal double horizontal division is sometimes seen, the lower part being made much the most important. A conspicuous example is the well-known front of St. Peter's, at Rome (Fig. 83).

In this the basement is suppressed, and the order below and attic above remain, constituting a division into two parts, the lower one much the most prominent. Many other examples might be added of a similar inequality. In fact, if we go beyond the limitation to the vertical wall surface, and take the roof into consideration, it is at once seen that every building with a visible pitched roof is thereby naturally divided into two parts, the wall below and the roof above, and that of these, the roof is usually much less in height than the walls. If these are taken into account, the number of buildings that are divided horizontally into two parts of which the lower is the greatest far exceeds that of any other type.

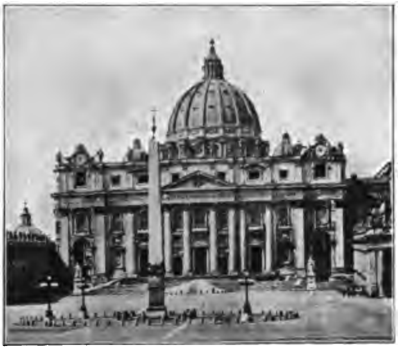


Fig. 83.
St. Peter's Church, Rome.
Horizontal division into two unequal parts, of which the lower is greater.

There is another very frequent method of horizontal division, that, namely, into three parts; and this, like the double division, may be distinguished as of equal or of unequal parts.

Of three equal parts the Strozzi palace (Fig. 84) is an admirable example.

Not less excellent as an example is the Vendramini palace (Fig. 11), and the familiar Farnese palace is a third.

In buildings that comprise pavilions as parts of their composition, this triple division is often combined with the double division before described, the triple division being used for the pavilions, the double for the connecting or attached parts, Fig. 52, *c*.

Of buildings that are divided into three unequal parts, the usual and normal type, so to speak, is that in which the middle part is considerably the largest, of which Fig. 85 is a fair sample. This is analogous to the division of the column into base, shaft, and capital, or of the order into pedestal, column, and entablature, in either case marking the middle division as that which should predominate.

The validity of this treatment, of dividing the wall into basement, shaft, and frieze, has received an interesting illustration of recent years in the many very tall buildings that have been erected.

Lacking precedent, and thrown back upon the spontaneous æsthetic sense for guidance; forced, too, to its exercise by the conspicuous size of these great buildings which does not permit their appearance to be slurred over or ignored, both architect and layman have united in approving the basement, shaft, and frieze treatment as the most pleasing and satisfactory.

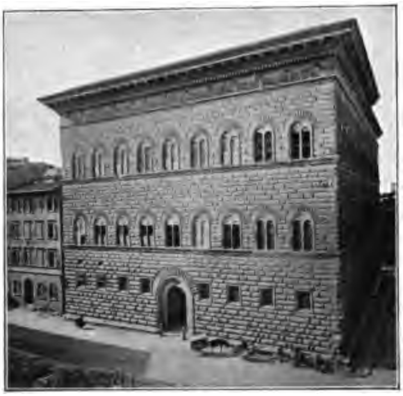


Fig. 84.
STROZZI PALACE.
Horizontal subdivision into three equal parts.

Briefly recounting our classification, we have found three classes of buildings with respect to their division by horizontal lines: first, those that are not divided at all, but form a single part, included between base and cornice; second,

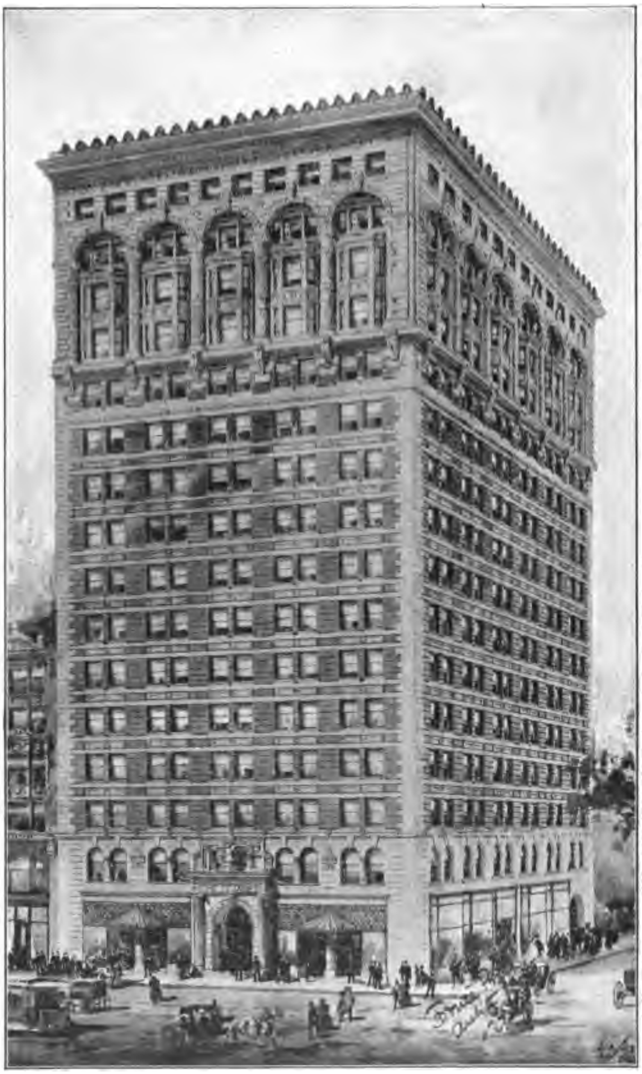


Fig. 85.
Horizontal division into three parts, of which the middle part is greatest.

those that are divided into two equal or two unequal parts; third, those that are divided into three equal or unequal parts. These are shown in diagram in Fig. 86, and these are all of the possible variations of horizontal division in which the parts are one or two; and three out of seven possible variations where the parts are three; and these two are all that are available in composition. The four remaining three-part variations can be used only by such treatment as will throw them into one or the other of these classes.

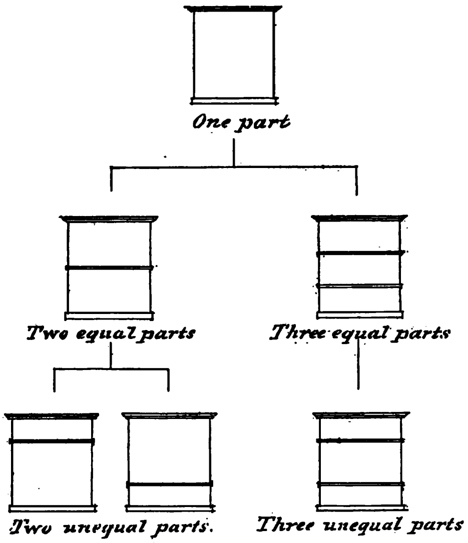


Fig. 86.
Diagram of all possible modes of horizontal subdivision.

Thus at *a* (Fig. 87), a six-storied building has three stories included in the upper tier of arched openings, two in the basement and one in the space between. Now there are two ways of regarding this middle space, either as a frieze to the basement, and in that case the upper one of the two mouldings which bound it must be larger than the lower, as at *b*, or as a base to the upper part, making the lower moulding the largest, as at *c*. Indeed, the smaller moulding might be omitted entirely, which would render the assignment of the middle part, whether to the upper or lower division, more clearly discernible.

Fig. 88 is a diagram of the seven possible three-part arrangements comprising the original type of three equal parts and those of three unequal parts.

Of these seven Nos. 1 and 6, together with the upper unnumbered figure, in which the parts are equal, are the types that have been included in the former diagram at Fig. 87. The rest can be treated only by a process such as we have described, by regarding them as compositions of two parts, one or the other of which is itself a minor composition of two parts. Thus in No. 3 the lowest part is naturally regarded as a base for the lower part of a two-part composition, while in No. 4 it must be regarded as a frieze for the upper part.

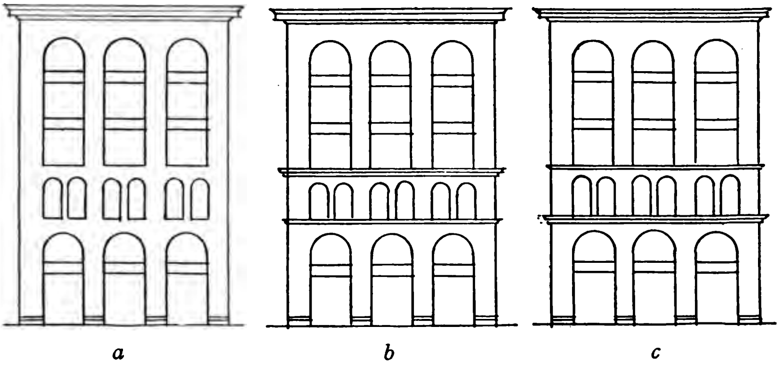
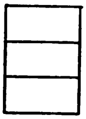


Fig. 87.
Horizontal division into two parts, and assignment of small middle portion to one or the other.

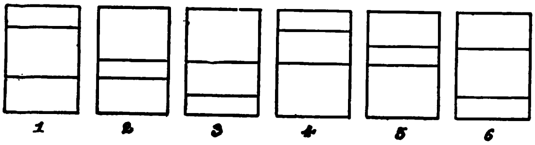
In the same way, if four or more parts are used, they must be subordinated to each other in such a way as to secure a clearly marked general division of the whole into two or three parts as we have indicated.

The conclusion is, that if we exceed two or three parts in our horizontal division, we can make the results pleasing only by subordinating the additional parts to the two or three that we have admitted as our foundation. If we fail to do this the whole composition becomes an unintelligible jumble of parts in which the eye discerns no fundamental unity of conception.

But, with such subordination, we can handle any reasonable number of minor parts, provided that they fall easily into the simple groups of one, two, or three main parts that we have enumerated.



Three equal parts.



Three unequal parts.

Fig. 88.
Diagram of all possible modes of horizontal division, of which only three are available.

There are notable analogies, it will be remarked, between the vertical divisions before discussed and these horizontal divisions.

In the first place, the analogy in number is noteworthy: one, two, or three parts horizontally, correspond precisely to the one, two, or three masses which, as we have seen, may be used as vertical divisions. In the second place, there is a close analogy between the two equal or two unequal horizontal subdivisions and the two symmetrical or two asymmetrical masses of vertical arrangement. In the third place, the rule that in triple horizontal subdivision, the middle part must be the largest, is paralleled by the fact that the central one of three masses must be the largest; while three equal horizontal subdivisions match the like number in secondary, if not in primary masses.

And the reason is the same as in the case of masses: the mind accepts one thing with one more attached, either on one side or on both sides, as a unit, but beyond this the sense of unity is lost, and a sense of multiplicity takes its place.

So true is it that three is the limit of horizontal parts, that it is almost as difficult to find examples of four evenly divided parts as of the corresponding four-part division of vertical masses. Even where they occur, they show attempts to subordinate one part or the other, as we have seen should be done.

Here are two examples (Figs. 89 and 90). In Fig. 89 it is evident that there are four parts in the front. Not only are there four stories, but each of these is carefully separated from the next by a deliberate moulding. It is true that the stories are distinguished, to some extent, by a difference in treatment, but this has not been carried far enough to overcome the first impression that there are four, or at least an impression of multiplicity instead of that of unity. The second story is manifestly superfluous; and it is easy to imagine how much the appearance would be improved could this story be omitted.

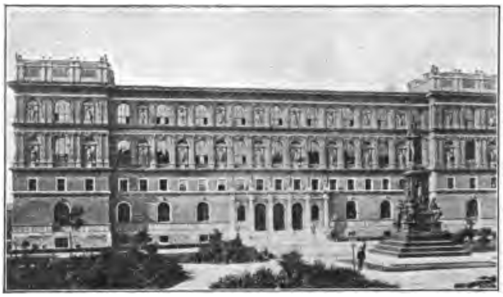


Fig. 89.
ACADEMY OF FINE ARTS, VIENNA.

Horizontal division into four parts, which would be improved by merging the second story into the first more completely.

It is plain, too, that the architect has held this opinion, for he has done much to merge the second story in the first by similarity of wall treatment and by diminishing the moulding between these stories to a string, while elsewhere there are full cornices. Had this been carried still further, and this moulding omitted altogether, the design would have been much improved.

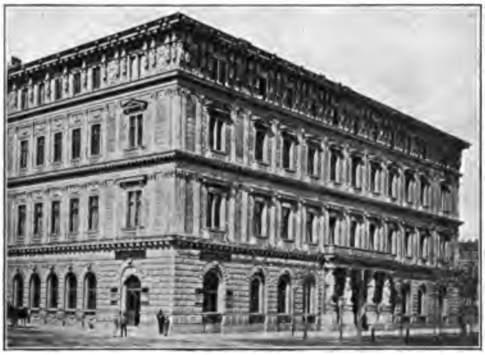


Fig. 90.

Palais Epstein, Vienna.

Division into four parts horizontally, which would be improved if the fourth story were treated more completely as a cornice.

Another step might have been taken and the architraves of the second story windows omitted, reducing them to mere holes in the wall, more fully obtaining, what the architect has evidently attempted, the complete fusion of first and second stories in one, and a satisfactory three-part division of the whole.

Fig. 90 is another four-part division, with the usual scattering and unconcentrated effect. In this, however, it is the fourth story which the designer has tried to suppress with faint success. As it is, he has endeavored to make the whole story into a sort of cornice or frieze by a continuous series of vertical enrichments upon the wall surface between the windows.

If he had had the courage of his convictions, and had brought the overhang of his main cornice down to the very heads of the fourth-story windows, converted the cornice below them into a proper tœnia moulding, and made the vertical objects into something more like the usual console or bracket, he might easily have completed the cornice effect of the whole story, and have thus obtained the three-part effect for which he was striving.

There are many other compositions in which, guided by instinctive taste, the architect has made an effort to reduce four or more natural divisions to two or three, but has stopped short of the desired end from lack of boldness in reaching out for a result which was not clearly formulated in his mind.

Where the designer fully realizes what it is necessary to achieve, it is almost always practicable, by proper treatment, to fuse some stories into one, to nearly eliminate others, until we obtain a composition in a single part, or in two or three parts, any of which is sure to be satisfactory.

Another very frequent use of apparently redundant horizontal mouldings is in the cases where a whole story is used as a band of separation, as often occurs in very tall buildings.

It is not unusual, in these, above the four or five stories that form the basement, or below those that form the frieze, to find a story with mouldings above and below, and with enriched treatment of one sort or another, the whole marking the line between the basement and superstructure, but not constituting a division of the wall surface, in any proper sense. This is seen in the enriched story below the upper arcade in Fig. 85.

Before passing on to the consideration of other ways in which four or more horizontal divisions may be used, let us revert briefly to some of the analogies that we have before alluded to, between double and triple divisions, whether in a vertical or horizontal sense.

In double division, both vertical and horizontal, we can pass freely from the two equals to two unequals, either seeming quite natural and satisfactory.

There is this difference, however, that in the case of two vertical parts, whatever be the inequality of size, similarity in general appearance is essential; while in the case of horizontal division they may be either similar or dissimilar, certainly the latter when they are unequal, while there is little choice when both are equal, similarity and dissimilarity being both used with freedom.

In triple horizontal division there is the same tendency for one part to be made larger than the others that we observed in the discussion of vertical masses. And there is the further analogy, that the largest part must be the middle part.

Apparent exceptions, such as the Doge's palace at Venice, in which the uppermost part is the largest, and the middle part the smallest, are often found to be, as in that building, instances of a double division with one of these subdivided again into two. In this palace the two lower stories are of closely assimilated arched treatment, thrown together into one by that similarity, and also distinguished thereby from the upper part, which is a particularly flat, unbroken wall surface.

There is a strong tendency, in many buildings, to this method of treating two of the wall surfaces alike, and the third in marked contrast. Such is the Vendramini palace (Fig. 11), in which the second and third stories are alike arched and columned, the first story quite different, being as far as possible a plain wall surface.

Here, again, is a striking analogy with the tendency in groups of three masses, to make two alike and the third of an entirely different character, with such minor differences only as are really unavoidable on account of the radical differences in the constructive relations of things piled on top of each other and things standing alongside of each other.

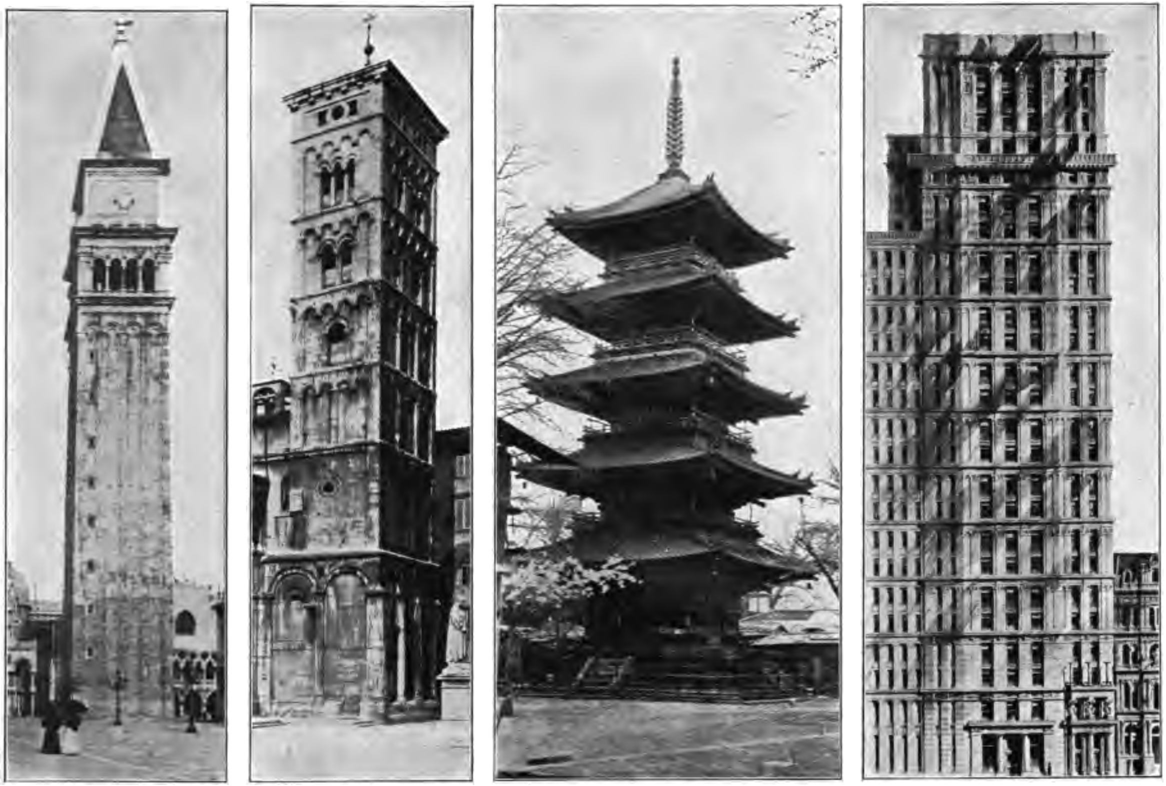
The last way in which buildings can be divided horizontally presents an equally striking analogy to the corresponding arrangement of vertical parts. It is the continuous arrangement to which we here allude.

Just in the same way that four or more secondary parts in vertical grouping form a series that depends upon its continuity and uniformity for its unity; so four or more parts may be used in horizontal division under like conditions.

Inasmuch as the parts are usually of necessity made to correspond to the stories, more than four parts means a building of considerable height, often a veritable tower; and accordingly we find a vertically continuous composition in such buildings only.

In many towers, and in many of the recent tower-like buildings, which are arranged with a basement, shaft, and capital, we find that the shaft, instead of tall, uninterrupted piers, such as had the but lately fallen Campanile at Venice, for an example, has the whole middle portion cut up by horizontal mouldings at each story, into a series of slices, piled one on top of the other.

In Fig. 91 are shown several of such buildings. At *a* is the Campanile of St. Mark's, with vertical treatment of the middle portion, for comparison with the opposite method, which is shown in the three other examples. At *b* is the Campanile at Lucca, in which the continuity of the middle stories is seen, all alike above the basement until we come to the topmost; at *c* is a pagoda, where a precisely similar arrangement is seen, although in a totally different style;



a. St. Mark's Campanile. *b.* Campanile at Lucca. *c.* Pagoda at Tokio. *d.* St. Paul Office Building, New York.

Fig. 91.

Continuous treatment of middle part of three-part horizontal division.

while at *d* is a modern office building. The fundamental identity of motive in *b*, *c*, and *d* is easily seen; each consisting of a top part and bottom part, with the larger middle part cut up into a series of uniform slices.

Now the conditions which apply to this vertical continuous arrangement are the same as those for a colonnade, or any horizontal series: the units composing it must be all alike, and all of the same size. Even when a gradual diminution of size in the building requires a difference in the diameter of the stories, the height of the stories must be equal, or only diminished very slightly to match the taper of the tower, so that to the eye they still appear to be equal. The design of the units, too, must be alike; the windows, if such occur, equal and arranged in the same way; otherwise the same sort of hiatus would be felt as in the colonnade with a column missing. Variety may be all very well in its place, but a continuous series, vertical or horizontal, is distinctly not the place for it.

At the most, perhaps a small balcony or some similar evidently extraneous embellishment might be introduced, corresponding to the central motive of the Farnese palace (Fig. 108), offering a point of concentration for the whole composition, while not interrupting the evenness of the series.

A word may be said, in conclusion, as to the treatment of roofs.

Roofs, as before noted, in buildings having visible roofs, constitute a natural division into two parts of the entire composition, the lower one being the perpendicular wall, the upper, the roof itself, of whatever character.

The roof may be treated as the crowning member of a two- or three-part composition, the wall below being undivided or divided into basement and shaft only; or it may receive separate treatment, as the upper member of a two-part composition, the wall surface being treated independently.

Roofs naturally fall into two classes as far as composition is concerned: those that run up to a point and those that have a horizontal ridge. Many roofs will have one classification as regards the broadside, and another from the gable point of view.

As to the pointed form, it makes little difference whether the point is that of a gable or that of a pyramidal or conical roof. The principle of treatment is the same in all.

In the case of mansard roofs, or what are usually called mansard roofs,—the true mansard is more nearly what is commonly known as a gambrel, or rather it might be called a hipped gambrel,—in these the horizontal line is seen from every point of view, the upper part of the roof being either flat, or of so low a pitch as to be out of sight.

The pyramidal outline, whether of gable or receding roof, is associated with the individual, perpendicular parts of the composition; the horizontal roofs with the horizontal and continuous parts.

Even where a building is a horizontal composition as a whole, topped by a comparatively low and long straight-ridged, hipped roof, the effect of the inclined lines of the roof in profile often is of the happiest in adding a sense of individuality to the building, without diminishing the general horizontality of treatment.

The same advantage, in a converse sense, attaches to the use of a small ridge at the top of the tall roof of a pavilion. So used the truncated pyramid falls more easily into harmony with the horizontal lines of the rest of the roof than if its individuality had been still further intensified by carrying the pyramid to an apex.

As for horizontal divisions obtained by other methods, such as by overhanging or setting back, in one or more offsets, the whole upper part of the building, little needs be said. So rarely is such construction practicable, and so closely will the general principles that we have stated apply, that a demonstration at length would be superfluous.

XII

PROPORTION

THE word proportion is very often used as if good proportion, that is, pleasing proportion, were an inherent quality, quite independent of conditions or circumstances.

We continually hear such phrases as "a well-proportioned window" and read discourses upon the ideal proportions of openings, and other things, as if proportion were something absolute—a desiderandum to be earnestly longed for and set before us as a goal, even though rarely attainable—like virtue, an ideal to be worshipped rather than practised.

Thus some have laid down that in a properly proportioned window opening the height should be just twice the width; others have held that the so-called "golden section" was the proper thing, the width to the height being as the height to the sum of the width and height, a rule which gives incommensurable dimensions, approximately, as 5 to 8, 5 being to 8 nearly as 8 is to 13, 8 times 8 giving 64, and 5 times 13, 65.

Now this view may be well enough in connection with the style of architecture for which it was devised. It is not sufficient for a system which aims at laying down general rules, applicable to all styles past, present, and future.

The truth is that the proper relative dimensions for any part of a building, that is to say, the ratio between the width and height, cannot be definitely laid down without reference to the relative dimensions of the other parts, and especially to the relative dimensions of the building itself.

The rule above alluded to for window openings will be found to work well enough where the dimensions of the front are in somewhat the same ratio, the height a half or five eighths of the length, or even with wider variations; but if we were to lay out the windows of a Gothic church by this rule, the result would be strange indeed.

A truer view we proceed to lay down, truer because generally applicable; and found to give a clew to results that satisfy the æsthetic sense, beyond which there is no appeal.

Proportion is very much the same in architecture as in arithmetic. It cannot be asserted of two quantities that they are in proportion. It is necessary that there should be two pairs of quantities, each pair having the same relation between its component quantities. Thus in the relation above given between building and window opening, we should have

50 ft.	:	25 ft.	=	10 ft.	:	5 ft.
Length of front	is to	Height of front	as	Height of window	is to	Width of window.

Thus, again, in Fig. 92 the rectangles at *a* are similar, base being to base as altitude is to altitude.

6 : 3 : : 10 : 5

while those at *b* are dissimilar; the relations of base to base being different from those between the altitudes, the proportion,

6 : 1 : : 10 : 8

not being true.

Broadly interpreted, this means that a building must be made up, in great part, of rectangles that are substantially the same in the relation of their linear dimensions;

that is to say, our composition must be either of long and narrow parts or broad and short parts.

Thus in Fig. 93 we have two elongated rectangles at *a*,

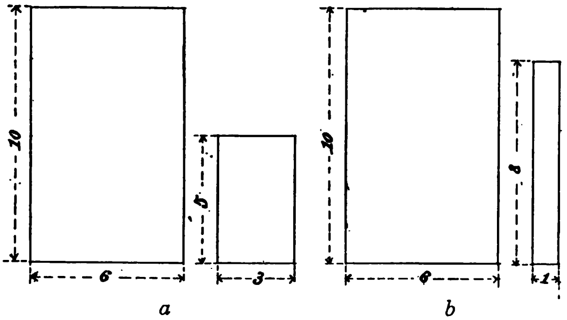


Fig. 92.
a. Similar, and *b* dissimilar rectangles.

and two more nearly approaching a square at *b*. Neither pair is exactly similar, but the approach to similarity is evident.

When the similarity is perfect, as in Fig. 94, the diagonals, as shown in dotted lines, will be parallel to each other. This gives a simple construction for laying out a drawing that is often available. When the relations are inverse, that is, when one rectangle is horizontal and the other vertical, the diagonals, instead of being parallel, become perpendicular to each other, as shown at Fig. 95.

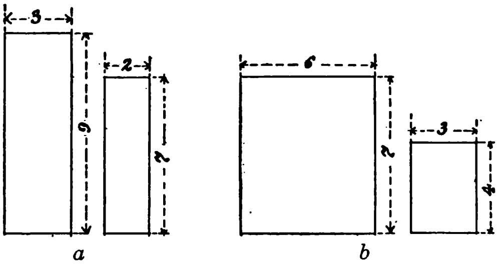


Fig. 93.
Two pairs of approximately similar rectangles.

It is not necessary in a composition that all of the rectangles, whether they are long and narrow, or broad and short, should stand in the same relation to the ground line. On the contrary, some may be placed on their shorter sides, and some on their longer sides as bases, without detriment to the result.

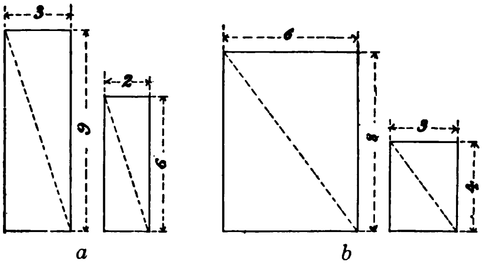


Fig. 94.
Two pairs of exactly similar rectangles.

Through these relations a composition may be rapidly laid out, or the relations of parts in an existing work may be easily and quickly recognized. The diagonals are to be drawn approximately to the angles of the parallelograms formed by mouldings and by vertical breaks in plan. Such measurements can be approximate only, and this for two reasons, and without at all impugning the correctness of the proposition by admitting the impossibility of its precision.

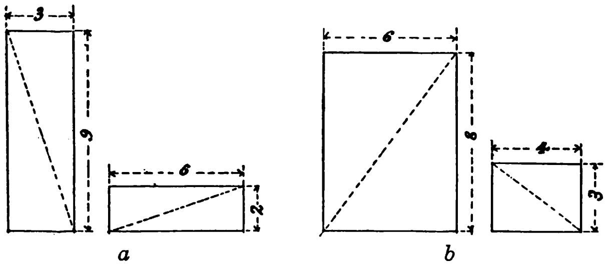


Fig. 95.
Two pairs of rectangles exactly similar and inversely proportional.

The first reason is that all that the eye requires is a reasonable approach to exactness. It is impossible to distinguish without measurement whether such relations are exact or not.

The second reason is that as the lines upon a front are marked by shadows of greater or less breadth, it is as much out of the question to insist upon precision of measurements as it would be in a charcoal sketch. There is no precise point to which to measure.

A third reason might be added—namely, that as in music the slight departures from purity of tone caused by the harmonics that intermingle, so far from displeasing, give to each instrument the character of tone that distinguishes it; so in linear composition, trifling discrepancies give zest and prevent satiety.

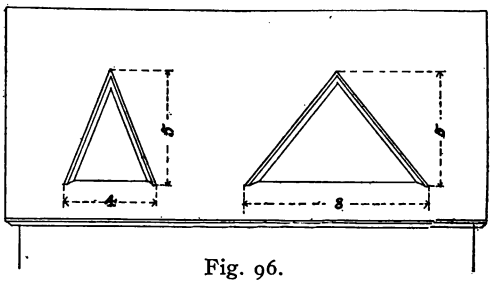


Fig. 96.
Disproportionate gables.

Viewed in this way, proportion is seen to be closely connected with the general similarity in shape of like parts of a building, that we have already found to be conducive to a pleasing result.

If we place two gables, of different pitch, alongside of each other upon the same roof (Fig. 96), the result is anything but pleasing.

The disagreeable appearance is due to the fact that the gables are dissimilar, as is evident at a glance, one being an acute, and the other an obtuse triangle.

If we reduce this to figures we shall have something of this sort:

4	:	5	=	8	:	5
Base of acute triangle	is to	Altitude of acute triangle	as	Base of obtuse triangle	is to	Altitude of obtuse triangle

a result which is seen to be untrue.

Nor is it improved by inversion,

4	:	5	=	5	:	8
Base of acute triangle	is to	Altitude of acute triangle	as	Altitude of obtuse triangle	is to	Base of obtuse triangle.

In either way the lack of similarity in the geometrical relations bears out the general lack of similarity in appearance which the eye attests and resents.

In the last analysis these two conditions are one, for, however complicated the figures that we may compare, if their dimensions are geometrically similar, the similarity of their outlines will be at once recognized.

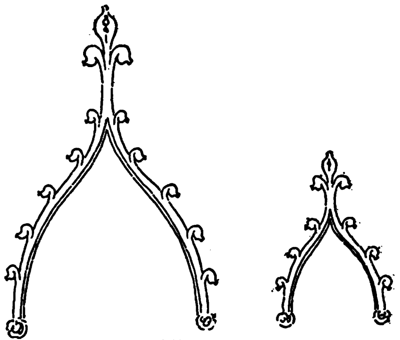


Fig. 97.
Two proportionate arch mouldings.

In Fig. 97 are two arch mouldings of reversed curvature, enriched with crockets and finials. These are, in ordinary language, alike, except that one is about half the size of the other; that is to say, they are generally similar in appearance, and any measurements that may be taken will be found geometrically similar.

This law of equality of proportional relations, applied to parts of the first order, means that the primary masses with their links and appendages shall have the same ratio of height to width, or, failing that, an inverse ratio. This is shown diagrammatically in Fig. 98.

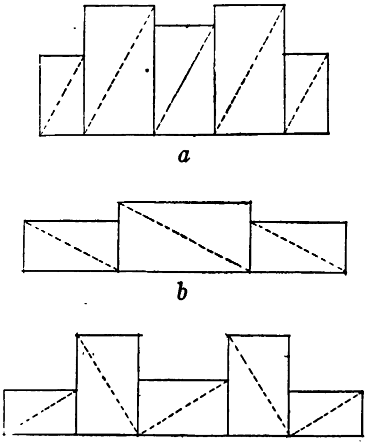


Fig. 98.
Proportionate relations between parts of the first order.

Three typical cases are shown. In the first (*a*), all of the parallelograms are placed vertically; in the second (*b*), all are horizontal, and in both of these cases the diagonals are all parallel to each other; in the third (*c*), some of the parallelograms are vertical and some horizontal, making the proportions inverse, and the resulting diagonals perpendicular to each other. At Fig. 99 is an example of what has been said.

In this the height of the main body of the building, from ground line to top of cornice, is almost exactly the same as its width; that is, the front closely approximates a square; each of the appendages is also nearly a square, and the diagonal lines which might be drawn would therefore be parallel. The primary parts are therefore proportionate.

Observe, too, that the roofs are of the same general shape. It is true that the main roof is somewhat higher in relation to its length, but all alike are long and low rectangles, approximately proportionate to each other. A second series of proportionate rectangles exists in the door and windows, all of which are vertically elongated rectangles, even to the eye not numerically proportionate, notably so the second-story windows of the main building, yet all of similar character, and some of them nearly proportionate.

It is not necessary that every part of a composition should conform to the same ratio: there may be two or more sets of ratios, and certain parts that conform to each.

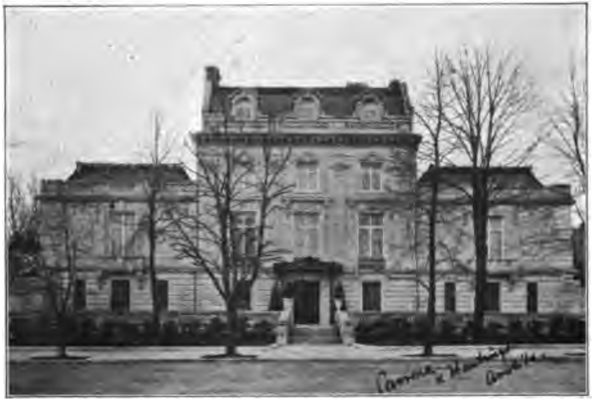


Fig. 99.
Townsend House, Washington, D. C.
Excellent example of correct proportion between mass and appendages.

Thus, in this instance, the mass and appendages are proportionate in one ratio, the roofs in a second, and the windows in still a third.

An example of classic reputation, the Villa Medici, is shown in Fig. 100. Here, again, the mass and appendages are squares, as in the previous case. And not only this, but the square is carried throughout into many details. The intercolumniations of the loggia strongly suggest squares, although they are not squares. The four panels on each side of the

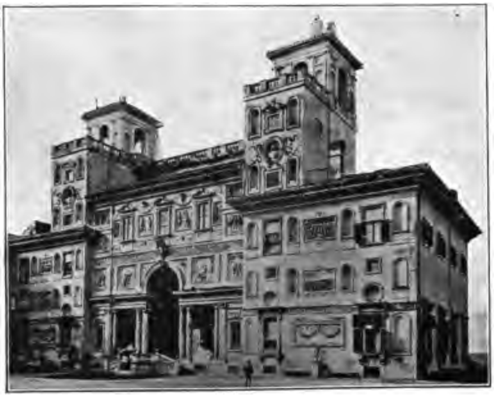


Fig. 100.
Villa Medici.
Mass and appendages are proportionate, being approximately squares.

arch over the entrance are squares, and so are those between the windows above, those below the third-story windows of the appendages, and those upon the anomalous pavilions or towers that stand upon the appendages. A second approximate proportion exists among the various rectangular windows, and the horizontal panels of the appendages; and still a third among the arched openings and niches.

Still another classic Renaissance example is at Fig. 101, the Villa Borghese. In this the ruling proportion is based on an approximate ratio of 2 to 3.

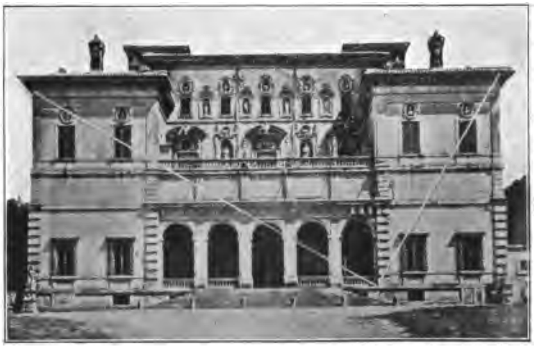


Fig. 101.
Villa Borghese.
Proportionate relations of masses and link.

The two primary masses of which the front is composed are proportionate to the arcaded link which unites them, as shown by the diagonal lines. Moreover, the height of the link is determined by the intersection of the diagonal with the inner vertical line of the mass, so that the upper story of the wing is necessarily in the same proportion. The lower story of the wing is also cut off in a like ratio by the cornice of the loggia, which is carried through; while the row of horizontal oblong panels over the arcade, and all of the window openings approach the same general proportion. Even the curvilinear niches, which usually would be circles, and which are circles in the previous example, are here elongated into ovals, in harmony with the oblongs of which the whole front is composed.

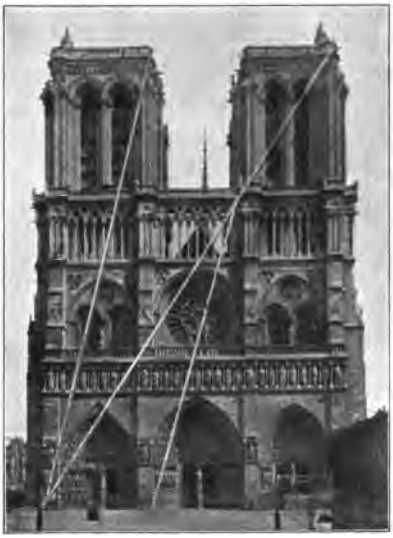


Fig. 102.
Notre Dame, Paris.
Proportionate relations of masses and link.

At Fig. 102 is a building of entirely different style and period, the Cathedral of Notre Dame at Paris, yet here again parallel proportionate relations prevail. Each of the masses is proportionate to the link, as shown by the parallel diagonals, but in this case directly instead of inversely as in Fig. 101, that is, both masses and link stand on their lesser sides as bases, while in Fig. 101 the base of the mass is the least side, that of the link is the greater.

The height of the part of the mass that extends above the link is here determined by the intersection of the diagonal of the whole front with the inner vertical line of the mass, which is analogous to the relations shown in Fig. 101, although not precisely similar.

At Fig. 103 the proportional relations in one particular are just the same as in Fig. 102.

In both of them the main diagonal shows that the ratios of base to height of the part of each primary mass above the link are equal to those of the lower part of the primary mass plus the link, and also to the ratio of base to height of the whole front.[1]

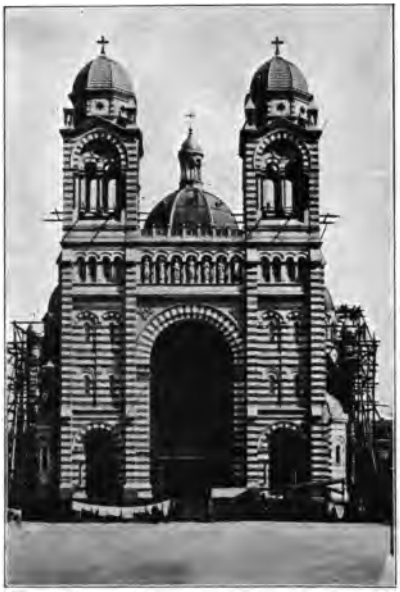


Fig. 103.

CATHEDRAL, MARSEILLES.

Disproportion between masses and link.

In Fig. 102, however, the relations between link and mass are quite different from those that obtain in Fig. 103. In the former, these relations are the typical ones shown in diagram (Fig. 98, *a*) of direct proportion between mass and link; while in the latter no relations of similarity are traceable between the corresponding parts, much to the detriment of the appearance.

This lack of proportion has the effect of making the link subordinate in height, indeed, but superior in width, as compared with the two primary masses, resulting in an uncertainty as to which is meant to be subordinate to the other, and this is one reason why the modern design is inferior to the mediæval.

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[1] In Fig. 103 the diagonal is not drawn, but the edge of a card laid over the figure will show the relations clearly.

Volumes might be occupied with the comparison and analysis of such proportional relations in various buildings. It is our aim here merely to suggest the method, leaving it to the student to make the application.

It will be found that the examination of the buildings of the past and of the present acquires an entirely new interest when studied in the light of the laws of composition that we have adduced. Scarcely one will be found to conform to them all, but there are still fewer, and none of the best, that fail to conform to some of them.

Figs. 104 and 105 are examples of failure in maintaining proper proportions.

In both of these the fault is the same—the tall, narrow, corner turrets have no relation of similarity with the main bulk of the building. It is broad and square; they are lean and thin; they are in ordinary phrase quite "out of keeping" with the primary mass of the building.

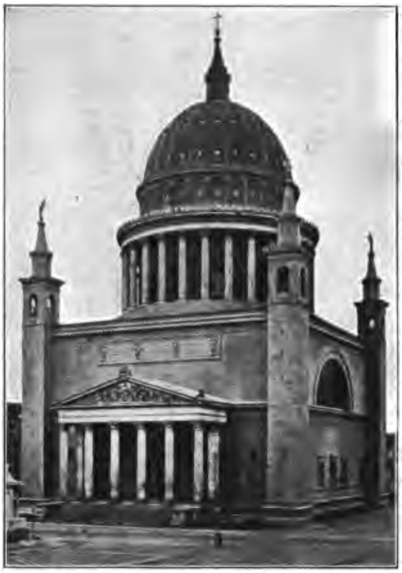

Fig. 104.
CHURCH OF ST. NICHOLAS, POTSDAM.

Lack of proportion between the broad primary mass, and the two tall, narrow secondary masses.

It is often a cause of wonder why the tower of the Florentine Palazzo Vecchio stands as it does, cut short, upon an impending parapet. One reason, at least, is, that to have continued it to the ground would have given this same unpleasant contrast between the massiveness of the building and the attenuation of the tower (Fig. 106).

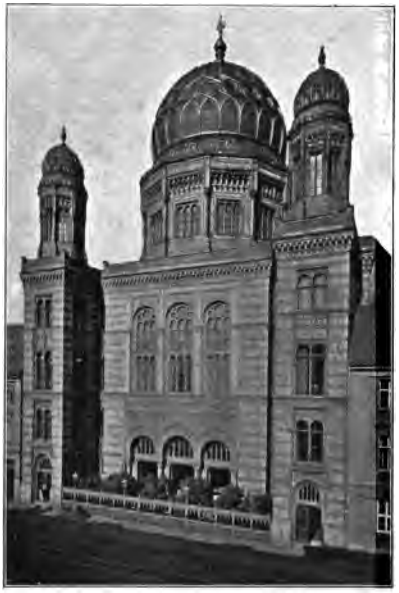

Fig. 105.
SYNAGOGUE, BERLIN.
The same fault as that shown in Fig. 104.

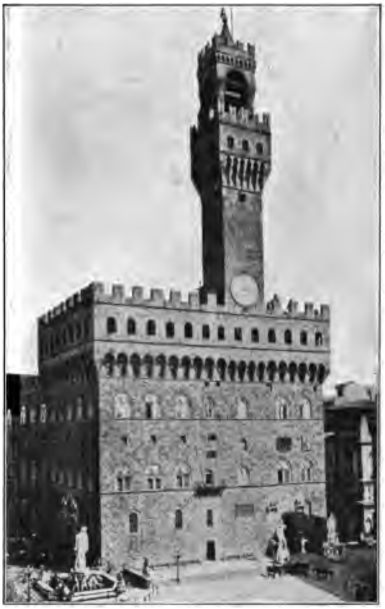

Fig. 106.
PALAZZO VECCHIO, FLORENCE.
The tower, if continued to the ground, would seem disproportionately tall and narrow.

Another instance of a secondary mass that conforms to the law is shown in Fig. 107, where the ratio of the height to the width of the portico is equal to the same ratio in the whole front, producing a particularly happy effect, which is felt before the cause of it has been assigned.

In the house shown in Fig. 60, the original intention was to carry the oriel windows down to the ground, forming bays in each story. It was found that this gave two tall, narrow objects, quite at variance with the horizontal motive that had been adopted as the keynote.

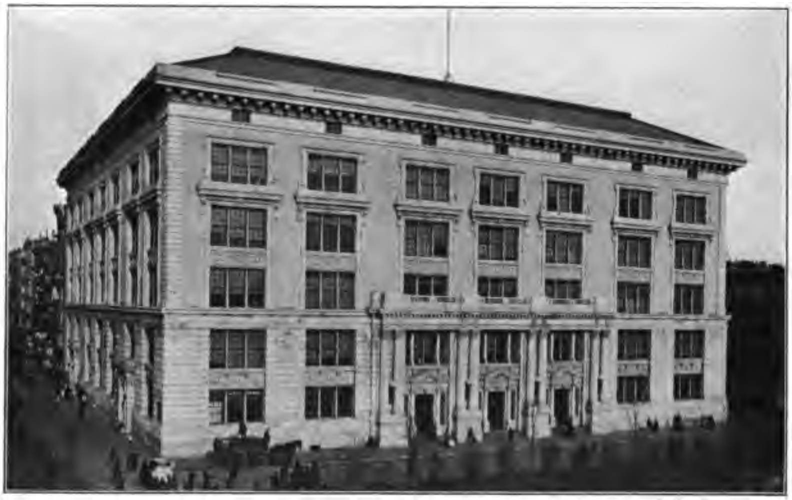

Fig. 107.
PUBLIC SCHOOL, NEW YORK.
The portico is proportionate to the whole front.

They were therefore shortened until the width was somewhat greater than the height, to correspond with the general dimensions of the front, although precise numerical proportion could not be attained. The rectangle of the veranda also preserves the same preponderance of width in comparison with the height.

The same law extends to the details of a building, of which the most conspicuous, in modern buildings, are the windows and doors.

In some of the monuments of the past the numerical relations of the details are very easily traced. The Farnese Palace, for example (Fig. 108), shows approximately these relations from measurements of a larger drawing.[1]

FARNESE PALACE

	HEIGHT	WIDTH	APPROXIMATE RATIO
Whole front	136	275	1 : 2
Main door	28 to crown of arch.	14	2 : 1
2d story window, clear opening	13	6½	2 : 1
2d story window, clear opening	24 including pedestal and architraves, but not pediment.	12 outside columns.	2 : 1
3d story window, clear opening	13½	6½	2 : 1
3d story window, clear opening	25 including pedestal and architrave, but not pediment.	13 outside columns.	2 : 1

These dimensions show everywhere an almost exact ratio of width to height of openings of 1 to 2, which is the inverse of those of the whole front.

Just how far the architect had in mind such a close numerical relation we cannot tell, but the fact is conspicuous, that in striving for a pleasing result he did adopt it, whether consciously or unconsciously.

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[1] These measurements, with those that are given of other buildings, are only relative, having been made from larger drawings and photographs by scale, and do not represent any actual dimensions in feet or any other unit.

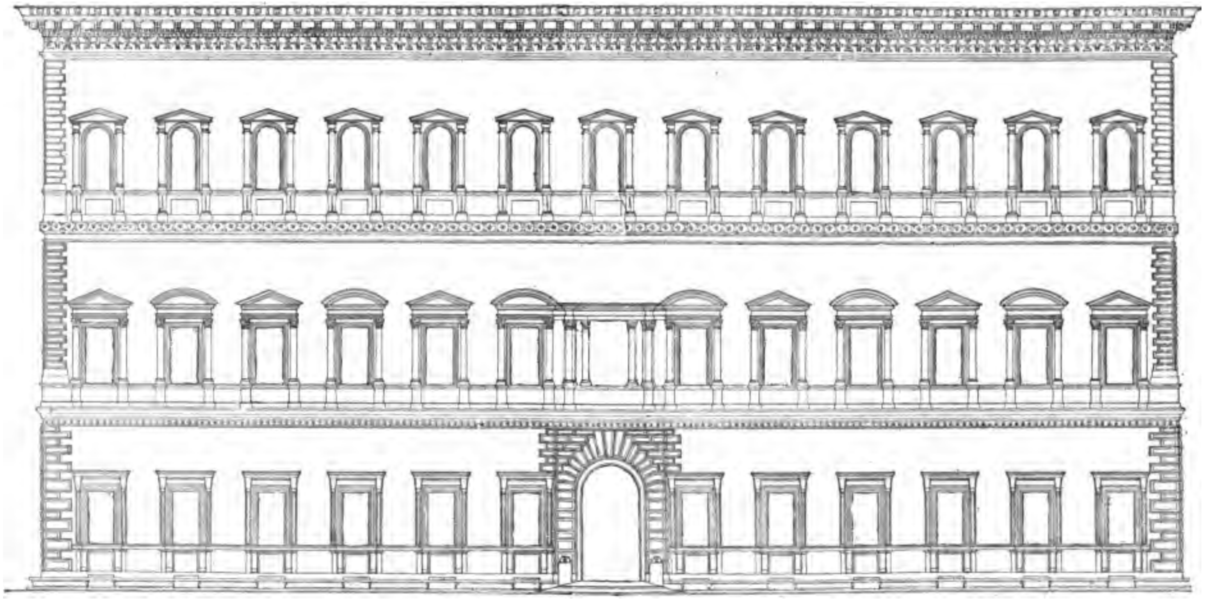


Fig. 108.

FARNESE PALACE.

Very close proportional relations subsist between the doorway, windows, and whole front.

In the Bartolini Palace (Fig. 109), the relations are as follows:

BARTOLINI PALACE

	Height	Width	Approximate Ratio
Whole front	160	120	4 : 3
Each of the 3 stories into which the front is divided			1 : 2
Main door	30	15	2 : 1
Main door	40 to top of architrave.	29 outside columns.	4 : 3
2d story window, clear opening	24	12	2 : 1
2d story window, clear opening	31 to top of architrave.	21 outside pilasters.	4 : 3
3d story window, clear opening	24	12	2 : 1
3d story window	31 to top of architrave.	21	4 : 3

Here we no longer find the same simple ratio prevailing in all parts.

The ratio of the front, width to height, the height here being greater than the width, is 3:4, which is found again, approximately, in the outside dimensions of the main entrance and of the windows in the upper stories. The three parts into which the front is divided are of slightly different height, although apparently equal, the relation of height to width of each being approximately that of the openings, 1:2.

Another example of a widely different type is the Hotel de Ville of Paris, of which the central portion is shown in Fig. 110.

The first column in the table contains the scale measurements. The second column contains the ratio of the measurements with considerable accuracy. The third column is the nearest simple ratio to which the actual ratios approximate.

Thus the first item, the ratio of the total height of the vertical wall to its total length is nearly $\frac{7}{16}$, approximating $\frac{1}{2}$; very nearly the same as the ratio of the dimensions of the vertical walls of the two pavilions, taken inversely; which

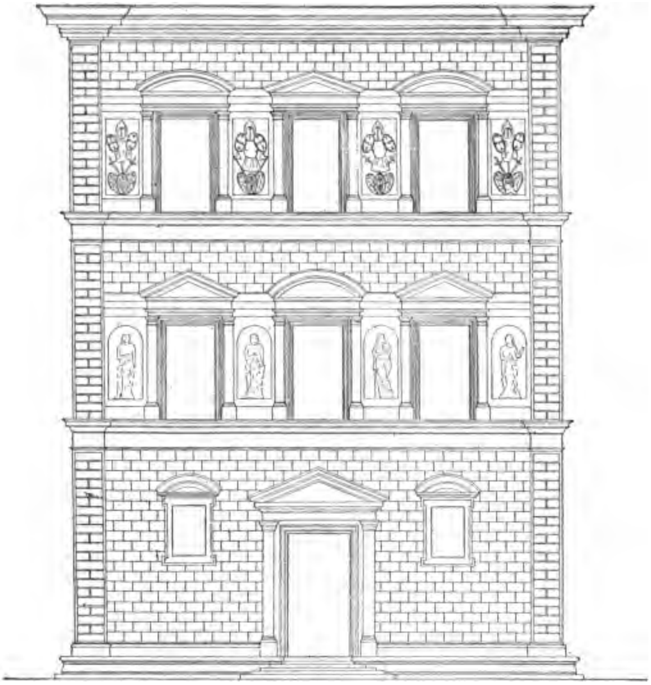


Fig. 109.
Bartolini Palace.

Proportional relations subsist between the whole front and the various parts.

is $\frac{3}{7}$. Comparing these by reducing to a common denominator we find the corresponding ratios $\frac{49}{112}$ and $\frac{48}{112}$, a difference that the eye cannot detect.

The windows have the correct academic dimensions, the width being one-half the height, with the notable exception of the most conspicuous row of windows in the front, those in the central part of the "bel étage," which are three times their width in height. This again corresponds with the dimensions of the façade below the cornice of the central link, and exclusive of the part of the pavilions that projects above it. Of this the ratio is $\frac{5}{16}$, inversely, which compares with the preceding as $\frac{15}{48}$ with $\frac{16}{48}$.

HOTEL DE VILLE, PARIS

	Scale measures—height to width	Actual ratios	Nearest simple ratios
Total height to cornice of pavilions and total length of front	28 : 64	7 : 16	1 : 2
Width of pavilion at third story, and height to cornice of third story	28 : 12	3 : 7	1 : 2
Roof of central link	16 : 32	1 : 2	1 : 2
First-story window	3 : 1½	1 : 2	1 : 2
Second-story pavilion window	4 : 2	1 : 2	1 : 2
Second-story window in central link	6 : 2	1 : 3	1 : 3
Height to cornice over second story, and total length of façade	20 : 64	5 : 16	1 : 3
Central portion of second story	8 : 32	1 : 4	1 : 4
Turret at each side	16 : 4	1 : 4	1 : 4
Fleche above ridge	20 : 5	1 : 4	1 : 4
Central link, height to cornice of second story and width between pavilions	20 : 32	5 : 8	2 : 3
Portion of pavilion above second-story cornice	8 : 12	2 : 3	2 : 3
Clock	9 : 6	2 : 3	2 : 3
Lower part of clock	4½ : 6	3 : 4	3 : 4

Corresponding relations are found in the dimensions of the various parts of the Greek temples. The conspicuous fact in the proportions of a Doric temple is the continual recurrence of horizontal rectangles of differing sizes, but of closely related dimensions (Fig. 111).

Above there is a row of the butt ends of the mutules; next below a corresponding row of regulæ, which are of equal dimensions with the mutule ends in most cases. Below these, again, is the row of flat faces of the abaci, also elongated horizontal rectangles. All of these are closely related among themselves, and also to the vertical rectangles of the columns.

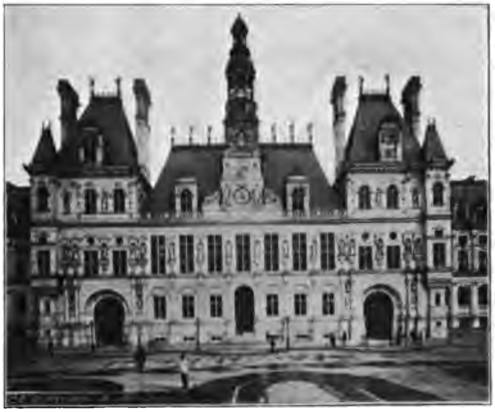


Fig. 110.
Hotel de Ville, Paris.
Proportional relations subsist between the various parts.

Taking the diameter at the base of the column, the relation of width to height is substantially the same as that of height to width of the abacus, approximately as 2 is to 11.

In one instance, at least, that of the great temple at Olympia, both the regula and mutule-end exhibit the same relation, but in most cases they are but half as broad in proportion to their length, having a relation of about 1 to 11. The fillets of the triglyphs exhibit the same relation very nearly, being as 1 to 12, while the channels between them are as 2 to 12, approximating the first ratio of 2:11, which is exactly repeated in the caps of the triglyphs.

These results may be tabulated as follows:

Column, diameter at base to height	2 : 11
Abacus, height to width	2 : 11
Cap of triglyph, height to width	2 : 11
Channel of triglyph, width to height	2 : 12
Fillet of triglyph, width to height	1 : 12
Mutule end, height to width	1 : 12
Regula end, height to width	1 : 12

showing the close conformity of all parts, large and small, to one or the other of two simple ratios.

These are the really important relations, of which the eye takes immediate notice, such relations as those between the width of the front and the height to the apex of the pediment being of little practical avail.

Nor are the dimensions in plan, nor the interior dimensions of any building of any meaning at all in connection with this part of our subject; proportion being essentially the relations of objects that are seen at the same time, and not of those which are only known by a comparison of measurements.

The following rules may be laid down for practical work, and with these many compositions of recognized merit seem to agree:

First. Let the front of the building and its various parts all conform to the same general type of rectangle, either the notably broad or the notably narrow.

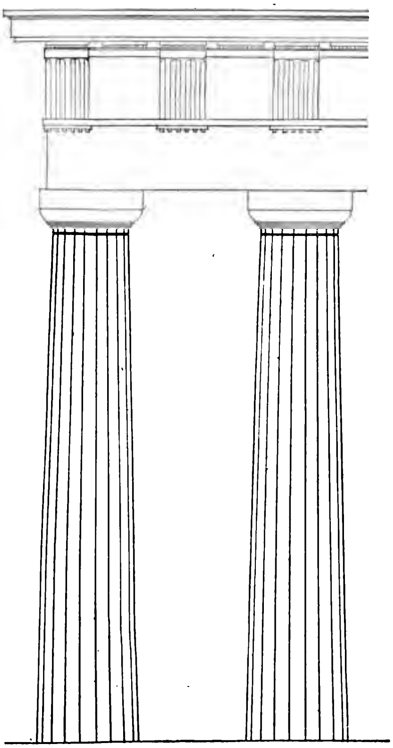


Fig. 111.

Proportional relations between the various parts of the Doric order.

Second. Let parts that from their difference in function are unavoidably different in dimensions, as columns, for instance, differ from doorways, conform to separate ratios.

Third. Instead of exact simple ratios, let the nearest convenient approximations be used, thus introducing slight differences into the general similarity. Instead of making a window opening precisely twice its width in height, make it 11 : 23 or 5 : 11, or 6 : 13, and use different variations in different tiers.

There is one application of the principle of similar dimensions of which we must speak before concluding, that is, to the proportioning of roofs.

In a general way it may be said that the roof, whether gabled, pedimented, or hipped, should conform to the mass below. If the mass is tall and narrow the roof should be tall and narrow; if the mass is low and broad, the roof should be low and broad.

Thus in Fig. 112 the broad and comparatively low mass of the Greek temple at *a* has a pediment of conformably low pitch, which would be included in a proportionately long and low rectangle. At *b* the Roman temple, with its loftier order, has one somewhat higher. Romanesque buildings of moderate proportions

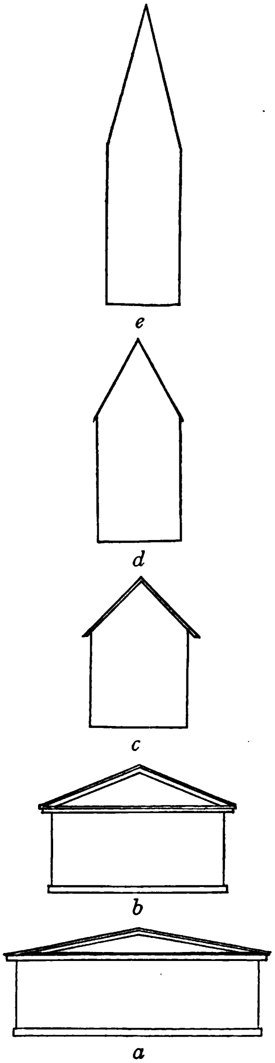


Fig. 112.

The roof should be proportionately related to the building below.

have still higher roofs, as at *c*, while taller buildings of the Gothic period have the roof still further elongated upward to match, as at *d*, culminating in the tower with the spire as its appropriate capping, as at *e*.

Now this upward stretching of the triangle of the roof as the rectangle of the front elongates is not merely a matter of historical interest, because roofs thus disposed are always appropriate in relation to the fronts upon which they are placed, whatever be the details of style adopted. As a matter of fact this principle of assimilating the roof to the mass below is instinctively carried out in the various parts of a complex front at all periods, and at the present time.

For illustration, glance again at the Hotel de Ville (Fig. 110), and note how the pitch is steeper and the relative height greater of the turret roofs than of those of the pavilions.

Curiously stumpy the turret roofs would look if they were made of the same pitch as the pavilion roofs, in spite of the general dictum that all the roofs of a building should have about the same pitch.

Nevertheless here, although the pitch is really so different, the effect is of about the same pitch, as the reader may find if he will take the trouble to lay out a corresponding tower and tourelle with roofs of equal pitch. The result will be somewhat like *a* in Fig. 113, where, although of parallel pitch, the tourelle roof looks too low, while in *b*,

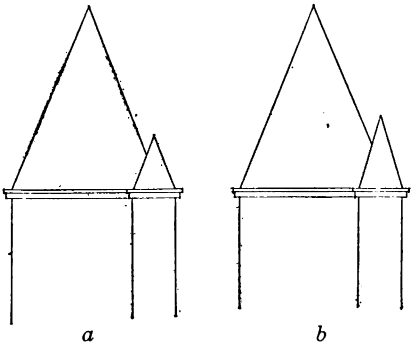


Fig. 113.

Roofs of taller and narrower parts, as the attached turrets, should themselves be taller and narrower relatively.

where the pitch is relatively steeper, it looks about the same, until we examine it critically, when we see the difference.

Often the pitch of the roof, whether gabled or pyramidal,

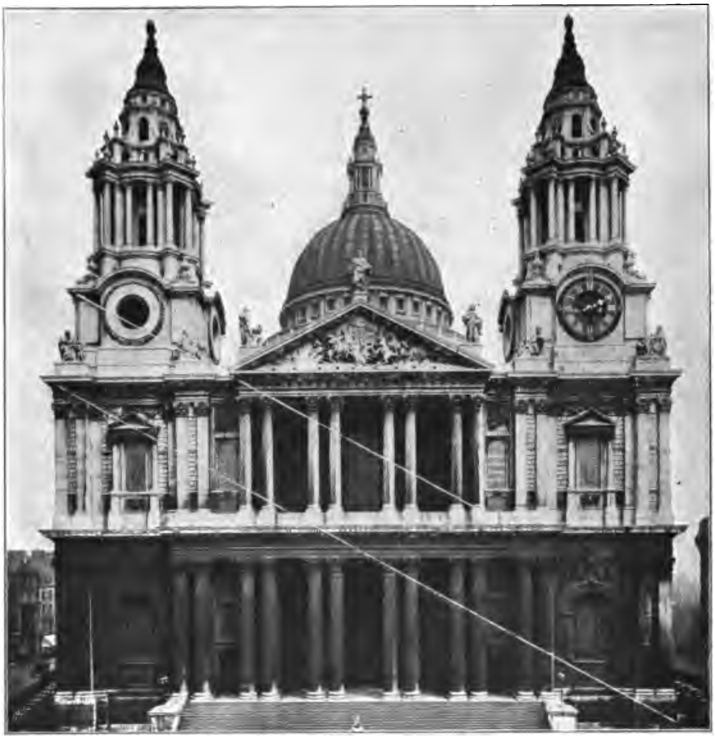


Fig. 114.
St. Paul's Cathedral, London.

is parallel to a diagonal of the whole front, or of some important horizontal division of the front.

In St. Paul's, London (Fig. 114), the pitch of the central pediment is exactly parallel to the diagonal of the second order of columns, and very closely to that of the whole front.

In the Hotel de Ville the lines of the pavilion roofs are approximately parallel to the diagonal of the front wall of the pavilion, as are those of the turret roofs to the diagonal of the turret above the corbelling.

Going back to Fig. 35, *c*, the truncated pavilion roofs, again, have precisely the same pitch, being parallel to the diagonals of the masses below; while at Fig. 115, the line of the main roof of each pavilion is inversely related to the building, being perpendicular to the diagonal of the whole front below. The roofs of the pavilions are also of the same height as the walls of the pavilions from water table to cornice, and therefore parallel to the diagonal of half the wall.

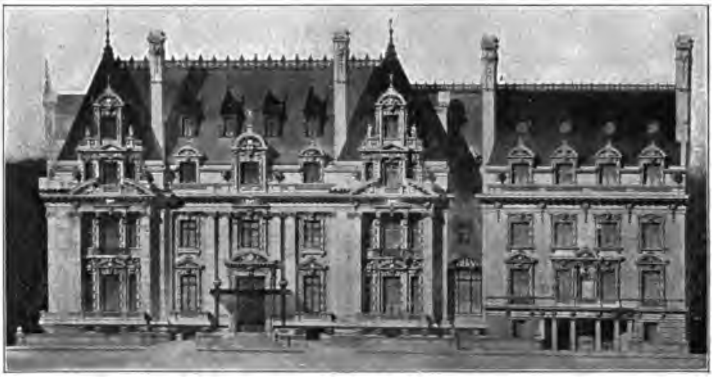


Fig. 115.

DESIGN FOR A NEW YORK RESIDENCE.

The peaked roofs of the pavilions are of equal height with the faces of their walls below, and might be inscribed within them.

Note, also, that the roofs of the little dormers are made steeper than the main pavilion roofs, the faces of the dormers themselves being also more drawn out vertically than those of the pavilions to which the main roofs correspond. The same thing is noticeable in Fig. 62, where the tourelle roofs are attenuated in comparison with the main roof.

In classical buildings, on the other hand, in which horizontal treatment predominates, the general dimensions are less in height than in length, and the pediments share this character to just the same extent. An example of a hexastyle Doric temple, at Fig. 116, shows that the rise of the pediment is equal to the height of the entablature, that is, the pitch is parallel to the diagonal of half the entablature, being much the same sort of relation found in Fig. 115. This was not preserved in the octastyle temples, the rise being greater than the entablature, which raised the relative, but kept the same actual pitch.

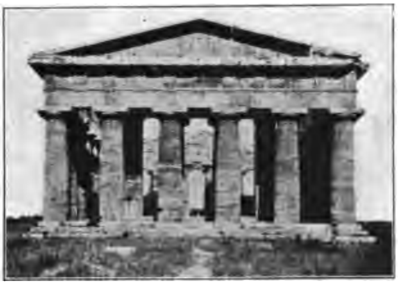


Fig. 116.

Temple of Neptune at Paestum.

The pediment is equal in height to the entablature, and might be inscribed within it.

In the Ionic temples the rise of the pediment is somewhat greater relatively, as is the height of the order in relation to its length, but no such simple relation can be detected as prevails in the Doric. Still greater was the relative height in the Roman Corinthian, corresponding to a still further addition to that of the order itself, and to its elevation on lofty stylobates, as in the Pantheon, in which the line of the pediment is related to the whole order, being parallel to a diagonal of the order, in a way very precisely similar to that seen in Fig. 115.

This is the artistic view of the phenomenon, of the gradual raising of the pitch of the roof from the Greek to the culmination of the Gothic period.

Historically, this development is merely an interesting fact, set forth by historians in their dry-as-dust fashion, as they set forth other facts, without relation to cause precedent, or effect subsequent; while from a constructional point of view the steepening has been ascribed to the more inclement climates of the north that needed a higher pitch to shed the rain, and more especially the snow. Neither of these is a sufficient explanation. The historical view does not pretend to explain at all, and as for the constructional view there is too much to contradict it, most of all the fact that the rise of the pitch occurred in all climates. The phenomenon finds a rational explanation only in an artistic one, the instinctive demand of the eye for a steeper roof on a relatively higher building.

In the case of certain buildings, naturally vertical, that is, in which the vertical dimensions considerably exceed the horizontal, but which are treated horizontally, as is done in some Italian campaniles, the roof may be proportioned to the uppermost of the horizontal divisions taken by itself, as if there were no building below it; or it may be proportioned to the whole building inversely, the lines being drawn, not parallel to the diagonals, but perpendicular to them, and including either the whole mass below or an important subdivision.

When it comes to determining the relative heights at which the horizontal mouldings should be placed, with which a building is usually subdivided, the general rule of proportion of similar rectangles does not apply.

By the very nature of the case there can be no similarity between the rectangle of the whole front and the minor rectangles into which it is thus cut up; nor can there be any similarity between these rectangles, unless, indeed, they are equal.

As a matter of fact they very often are equal, or substantially so; not only in the classical styles, where the superimposition of orders would lead naturally to an approximate equality, nor in storied buildings only, in which the practical requirements would produce the same effect; but in styles distinctly non-classical and in buildings that are but one-storied halls of the usual church type. Both in two equal parts and in three equal parts there are many examples of all styles and periods.

There is some doubt in comparing measurements of heights in façades, as to the proper point to which the figures should be taken, arising chiefly from the depth of the mouldings and of the friezes and bands which constitute the lines of demarcation. The stronger the lines, and the bolder the challenge to our sense of just proportion, the more difficult it is to test it by figures. Bear this in mind when testing the following statements; bear in mind, too, that substantially correct dimensions, measured to such leading lines as the eye marks at a glance, are all that is needed.

Of those in two equal parts the Banqueting Hall at Whitehall (Fig. 80), is an admirable example. Not only are the first and second stories equal, but the balustrade above the second is equal to the stylobate below the first. Another is the Stoedel Art Gallery (Fig. 52, *b*), and still another is the Villa Giulia, of which no illustration is here given, as it is an approximation merely, the second story being six-sevenths of the first in height.

There is a most interesting case of juxtaposition of new and old, Renaissance and mediæval, showing at once the likenesses and differences between them, in the Library of St. Mark and the Ducal Palace at Venice. The former is frankly divided into two equal stories; the latter appears at first as in three parts, as indeed it is, but upon measurement it is found that the sum of the lower two is equal to the third. The height of the lower half is so subdivided that, if the lowest arcade be called 4, that above it will be 6, and the wall above 10, making the proportionate relation which has before been noticed, 4 : 6 :: 6 : 10 nearly, strictly it should be 9, or rather all of the numbers should be adjusted fractionally to make an exact relation. This relation is called the "golden section," and is such that the first of two quantities is to the second as the second is to their sum:

$$a : b :: b : a + b$$

Another instance is at Fig. 82, in which the basement is to the main story as 3 is to 5, as close an approximation as whole numbers can give : 3 : 5 :: 5 : 8.

In addition to the Ducal Palace we may cite another example of a building which is divided into three parts, two of which are found to equal the third, although the building is separated from the former by leagues and centuries, the Vienna Academy of Fine Arts, Fig. 89.

In the Ducal Palace it was the lower half that was subdivided; here it is the upper half. No longer now by the "golden section," the division being nearly equal, say as 6 is to 7, although this is an excellent specimen of the difficulty that occurs in knowing just what lines to choose for measurement of heights. The lowness of the arches in the topmost part makes that part seem lower than it really is, while the shadow of the overhanging cornice gives no precise limit for measurement. But there is substantially, as said, an equal division of the whole height, and an equal division of the upper one of these parts.

The lower part, it is true, has a line of entresol windows, which appears at first as a fourth division, yet these are merged in the first story by the similarity of wall treatment, and the union would have been more complete had the moulded course below the entresol been entirely omitted.

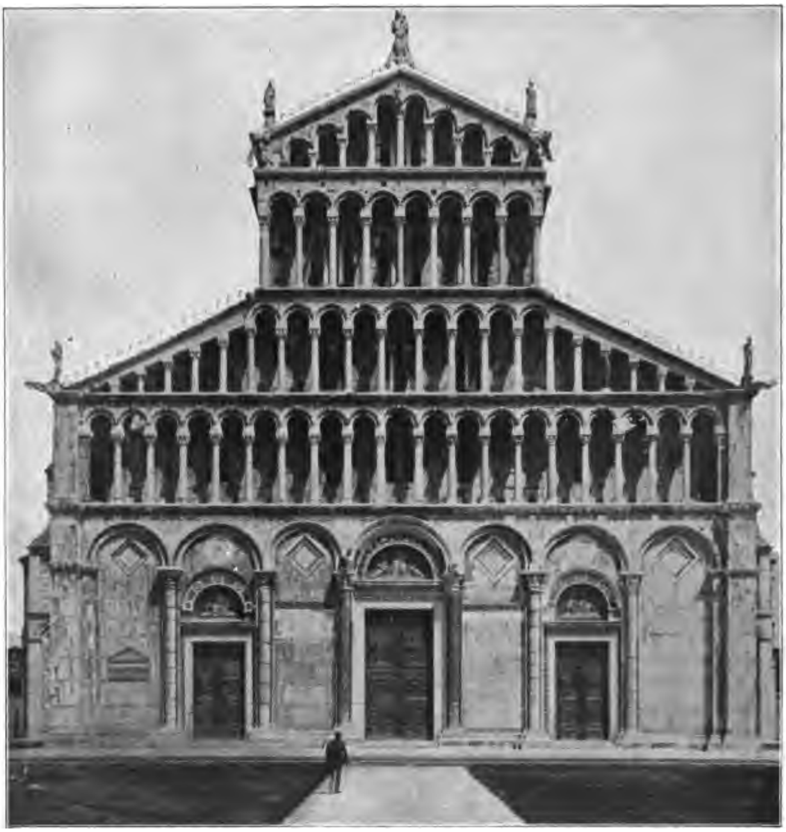


Fig. 117.

Cathedral at Pisa.

The front is divided horizontally into three nearly equal parts, of which the upper two are again divided each into two equal parts.

Passing on to unmistakable three-part division, we may instance the Lyons Bourse, Fig. 51, where the division seems at a glance equal, but is found to be, first story, 6; second story, 6; third story, 4, a difference far greater than would be supposed. The wall of the Strozzi Palace, Fig. 84, below the cornice and frieze is cut up by stringcourses into three parts that are, beginning at the top, as 7, 8, and 8; a much closer approximation to equality. In the Farnese Palace, Fig. 108, still beginning at the top, they are as 13, 12, 11, which is still closer, but in reversed order, the highest being uppermost.

An earlier example is the Palazzo Vecchio, Fig. 106, in which the division is 4, 8, 8, suggesting that of the Lyons Bourse, above mentioned.

Another, and a peculiarly valuable one, is the front of the Pisa Cathedral (Fig. 117). It is peculiarly valuable, first, because it is divided into stories entirely as a matter of beauty, and not at all for utility; secondly, because it is a building upon which were lavished all the study and skill that were possible; and in the third place, because style at that time was fluent and not fixed, and men were at liberty to do what seemed to them most beautiful, without regard to authority or precedent.

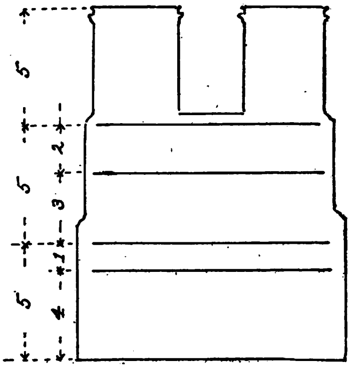


Fig. 118.

Diagram of heights of horizontal divisions of front of Notre Dame at Paris.

Minor variations undoubtedly occur and are essential to its charm, but the main skeleton of dimensions in its laying out was clearly a triple division, of which the large first story arcade was the first, with two tiers of the smaller arches to each of the others.

Another very curious instance of irregularity based upon regularity is in the façade of Notre Dame, of Paris, shown in outline in Fig. 118. No relation is discernible, at first glance, in the heights of the rows of arcades that adorn it; upon measuring them we find the peculiar 1, 2, 3, 4, 5, or rather, 5, 2, 3, 1, 4, dimensions shown. These leave us more than ever at sea, as there seems nothing but caprice in their arrangement, until we notice that the sum of 3 and 2 is 5, and that the sum of 4 and 1 is also 5, making the whole an exact, although not precise, division into three equal parts.

It would seem from these instances that some of the most delicate and carefully studied height relations in the buildings of the past have been based upon a fundamental division into equal parts.

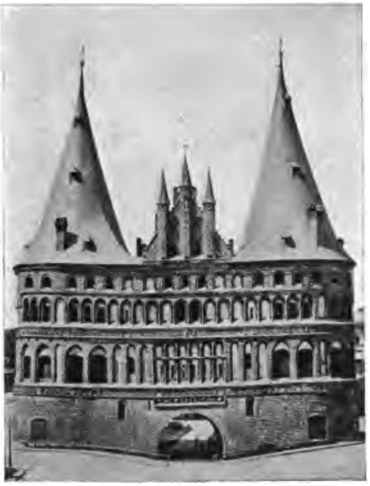


Fig. 119.
GATEWAY, LUBECK.
Divided into three equal parts horizontally.

Still another example is seen in Fig. 119, the ancient gateway of the city of Lubeck —which resists all attempts to reduce it to figures, until we hit upon the fact that it is divisible very closely into three equal parts, measuring at either extremity and disregarding the irregularity of base line caused by the hollowed-out roadway; and if we call the whole height 27, and each of the three main divisions 9, of these three the uppermost is quite naturally divisible into 4 and 5 parts respectively.

So that our first rule will be somewhat thus: Divide the front into either two or three equal parts, or such as shall seem equal at first glance.

The second rule will be: Divide the building into two or three approximately equal parts, and then subdivide some of these, in simple numerical ratio, in such a way as to distract the attention from the original division into equal parts.

XIII

CONTRAST

IT might seem that in speaking as fully as we have upon Similarity, we had by implication said all that needs to be said upon the subject of its converse, Contrast. Perhaps, however, a separate discussion of the latter may throw some further light upon it, and involve a closer attention to its correlate, Similarity.

Than these two principles there is none more habitually outraged by the carpenter-designer, who invariably ruins what might be passable, by sticking in "for variety" things that should not vary, balancing segmental pediments against pyramidal, putting peaks where horizontals are needed, breaking up the line of frontage in plan without rhyme or reason, and distracting what should be harmonized generally, under the plea that he is doing it "for variety."

So that it becomes doubly important for us to generalize, and distinguish, if possible, the cases where we must use contrast, where we may or may not at choice, and where finally we are forbidden entirely to use any contrast at all.

There are three ways in which contrast may exist, ignoring for the present the fourth way, contrast in color—which we are not to take into consideration at all.

To begin with there is contrast in shape, as of a triangle with a square, or a semihexagon with a semicircle. Next there is contrast in size, as of a portico 50 feet long and 20 high, with the building behind it, 150 feet long and 60 high. Last there is contrast of position, as when a narrow rectangle is placed perpendicular to another narrow rectangle, as column to epistyle; or as when a tall turret is placed upon a long and low building.

These three then, contrast of form, of size, of position.

What we usually mean when we speak of contrast, what the carpenter means when he puts a round turret on one corner, and a square one on the other, is contrast of form.

The first rule is that contrast of form in any part is not an essential quality. It is perfectly possible to dispense with contrast in form entirely; to make all the parts of a building, little or big, that serve similar purposes, more or less close reflections of each other in form. Such was the Gothic style in its most perfect development. Here every turret and buttress was crowned with its crocketted pinnacle, exactly reproducing the general outline of the spires upon the central and western towers; every vault, window, and door was spanned by the curved triangle—every roof likewise of triangular outline.

In the classical style there is the same avoidance of contrast of form. Every part is a more or less elongated rectangle.

The only really noteworthy contrast is that of the triangle of the pediment, and even this is kept as flat and as near to the horizontal as possible. It is interesting to observe that a similar contrast in the typical Gothic church is that of the rose window over the entrance, often the only important circular form in the building; and used, precisely as the pediment was used, to give unity to the main front by the introduction of a single contrasting and very much individualized object.

In more modest and more modern designs the same principle of similarity throughout, to the exclusion of any striking contrast, is shown in Fig. 60. All the roofs here are hipped, main roof, dormer, and piazza roofs; and, although practical and optical considerations forbade making them all of precisely equal pitch, or all of octagon plan, the general similarity of effect is maintained, and the central unifying detail, the triplet window of Palladian suggestion in this case, as in that of the classic and mediæval types above described, is the only contrasting form in the front.

In the same way a good design may always be made by keeping all parts of which the functions are the same, alike in shape, all roofs, for instance, of the same pitch, all windows square-headed or all arched, and, even when the functions differ, the similarity may be maintained, if at all compatible with the performance of their functions, without detriment to the appearance; as when a roof which should slope to best fulfil its function, is made flat to harmonize with a general flat, horizontal treatment.

Observe particularly that the lack of contrast in form does not prevent the greatest degree of contrast in size, as between the spire and the pinnacles, nor of position, as between the vertical oblong of the column and the horizontal one of the epistyle.

We have spoken of cases in which contrast of form may be omitted; we must note briefly one case in which it must be omitted.

This is among members of the same group, whether of primary or secondary masses, or of details. It should be unnecessary to speak of a fact that is so obvious, were it not that unskilled designers in their desire for "variety" often fall into this very mistake.

A square-corniced pavilion at one end and a gabled one at the other is a favorite device of the carpenter-designer to ruin his design in an abortive attempt to do something particularly striking.

Between parts of the same order, that is to say, between primary or secondary masses and their links and appendages, there may or may not be contrast whether of form, of size, or of position; as at Fig. 120, in which the same composition is shown with the links and appendages treated in contrast of form, at *a*, that is, with pitched roofs, while the twin masses of the group have no visible roofs, and at *b* in which neither the masses nor the links and appendages have any visible roofs, all being treated alike. Contrast of size is shown in both *a* and *b*, and between the masses and the links there is also contrast of position; and the contrast is, as it should be, if possible, greater between the appendages and the masses than between the link and the masses.

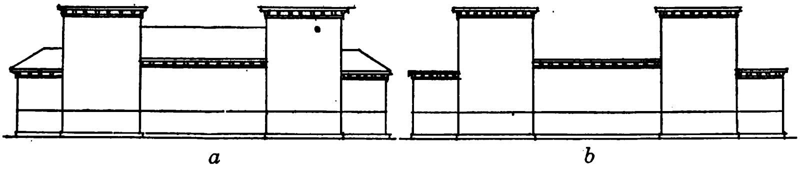


Fig. 120.

Contrast of form between the masses and their link and appendages is shown at *a*, similarity at *b*.

A like difference exists in *a* and *b*, Fig. 121, in which

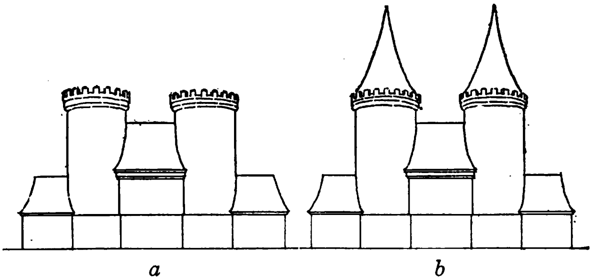
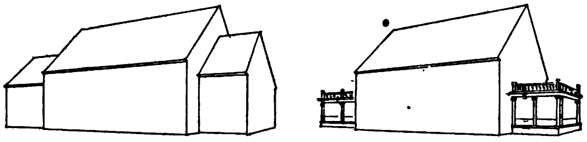


Fig. 121.

Contrast of form between the masses and their link and appendages is shown at *a*, similarity at *b*.

a shows contrast of form in treatment; *b*, similarity. In the first case, *a*, the primary masses have flat tops, while links and appendages are pitch-roofed; in *b* all are roofed alike. Either arrangement may be made to look well.



a *b*

Fig. 122.

The appendages at *a* are similar in form to the mass; at *b* they are in contrast.

It will not do at all, however, to make one tower pitch-roofed and one flat, as this would introduce a contrast in the members of the group which never produces an effect otherwise than lamentable. In this case the contrast in size is the same as in the previous example; while the contrast in position of the link no longer prevails, both masses and link being placed similarly erect.

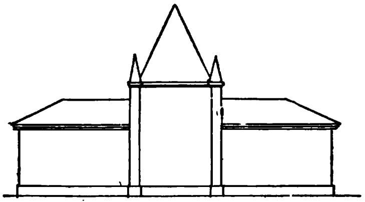


Fig. 123.

The roofs of the mass and appendages are similar in form, but contrasted in position.

The same rule prevails in the case of the single mass, with either one or two appendages, which may be either similar to the mass or in contrast with it.

Thus in a country-house design, it is practicable to make the appendages like the mass as at *a*, Fig. 122, all with pitched roofs and gables, or the former may be flat-roofed attachments of a high-roofed mass as was often done in colonial houses, or perhaps mere open verandas, which lend themselves far better to purposes of composition when placed as appendages than when extended along the whole front. Sometimes, as in Fig. 123, the mass and appendages may both have roofs alike in form, in so far as both are visible, pitched, hipped roofs, but contrasting in position, that of the mass high pitched, those of the appendages low pitched. In such cases it often looks well if the roofs are made of complementary pitch, with slopes perpendicular to each other instead of parallel.

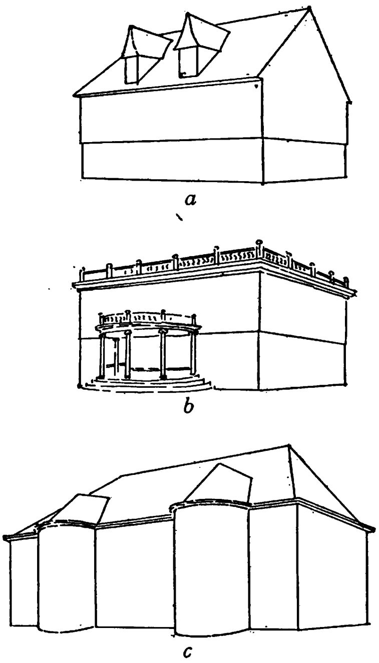


Fig. 124.
a. Contrast of position. *b*. Contrast of form. *c*. Contrast of both form and position between primary and secondary masses.

In the case of three masses, contrast of form, if used at all, must accompany contrast of size. When the masses are of nearly the same size contrast of form should not be used; but as the relative size of the central mass is increased, it may be of more strongly contrasting form. The links and appendages are subject to the same rules as in the case of two masses.

Between secondary masses and primary, contrast may often be used with very great gain in what is commonly called "snap."

In *a*, Fig. 124, the dormers are in contrast of position with the main roof, the former being of very high pitch, the latter rather low. Here again the pitch may often be complementary with good effect. In *b*, the semicircular portico is in contrast of shape with the straight lines of the primary mass, and in *c* the two bays are in the same sort of contrast with their primary. In all cases contrast may prevail between secondary and primary masses if desired.

In details, which in modern work are, for the most part, windows and doors, contrast, either of shape or size, is necessary when it is desired to pick out and group together certain individuals in double or triple combinations.

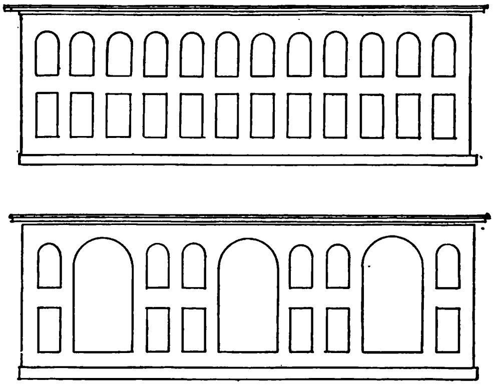


Fig. 125.

Transformation of continuous treatment into a triple group of details by contrasting size.

A triple group is formed, as shown in Fig. 125, from a row of windows that might have been uniform, by enlarging some of them to make the desired group, leaving the rest small. The smaller ones in such a case play the part of links and appendages to the larger ones that constitute the group, and, as in the case of these, may be either of similar or contrasting shape.

This principle is often used in many-storied buildings, some of the openings being thrown together under arches, which become the most conspicuous parts of the composition and the effective components of the group.

We have thus enumerated and classified the principal cases in which contrast is possible. It is not permissible, as we have seen, to make any and every part of a composition of all kinds of shapes and sizes simply for the sake of an alleged variety; on the contrary, the principle of contrast must be used to form, or to accentuate, groups of similar objects, whether of primary or secondary masses, or of details.

XIV

PRACTICAL APPLICATIONS

THE foregoing principles have been developed in very much the same order in which they will spontaneously unfold themselves in the mind of a designer who gives some thought to the apparently instinctive processes by which he proceeds.

Although the external appearance has been treated apart from any suggestion of the plan, it is by no means intended to convey the idea that an exterior should be, or can be, independent of the interior arrangement. On the contrary, it must, as has so often been pointed out, hang upon and spring from the organic internal disposition.

The organic internal disposition, however, is somewhat different from the accidental, arbitrary, or unorganized internal disposition.

Considered as an organism, a building is arranged internally in the same way as a vital organism, that is to say, upon lines of communication between the various parts.

Just as in the body there is an alimentary line of communication, and another of respiration and still others of circulation, nervous circuits and the rest; so in a building there must be the general line of communication between the various apartments, with usually a minor line for service, whether the ordinary domestic service of a house, or such service as the receiving and cataloguing department of a library, or the medical stores supply of a hospital.

These lines of communication form the basis of rational as well as of æsthetic planning, and of rational as well as æsthetic external composition.

The simplest possible plan of a building corresponds to that of the simplest possible plan of a living being—a cell with a single opening which serves for both exit and entrance, for both the users of the building and the service.

Such was the ancient temple, and such have temples in general continued to be, together with other halls of assemblage, with a continual tendency to increased proportion of the separate function of service, until in the modern theater or opera house the problem is to subordinate æsthetically the stage portion, which contains the service, although it immensely preponderates in bulk.

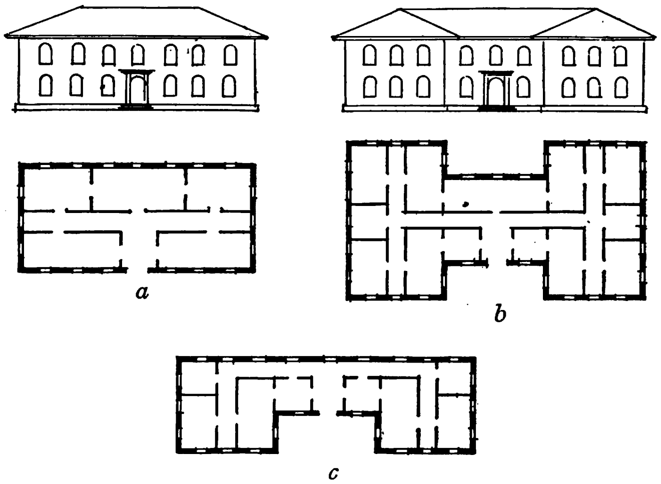


Fig. 126.
Rational connection between fundamental principles of planning and æsthetic principles of external design.

As soon as we leave the great, single-roomed building and come to those of several rooms the line of communication between them becomes necessary.

In its simplest form it is a corridor with the entrance at the middle of its length—the central point, from which all parts can be reached with equal ease, *a*, Fig. 126.

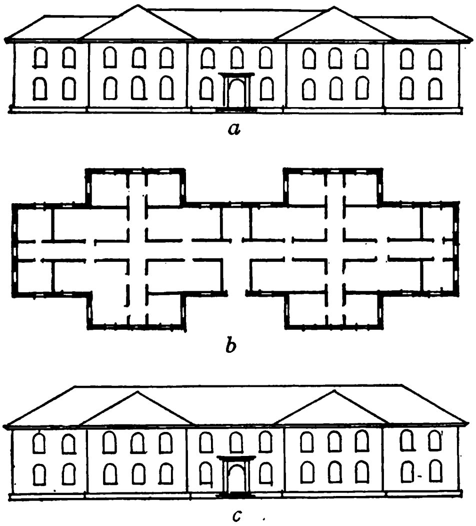


Fig. 127.
Further development of previous illustration.

When the number of rooms is so great that the corridor becomes inconveniently long, the most distant parts may be set at right angles, as at *b*, thus bringing them within a more convenient distance from the entrance, and forming the well-known H plan, or as at *c*, which is substantially half of the same arrangement.

These correspond precisely to the fundamental types of external design, the single and double primary masses.

In both of them the entrance is where it naturally should be, both logically and æsthetically, as near as possible to the main artery at its central point. If two entrances are required, for different uses, as for a main entrance and an entrance for service, they may best be placed, for both practical and æsthetic reasons, in the masses themselves, at the ends of the corridors.

A further development is possible to meet further requirements, as shown at *b*, Fig. 127. In this, after entering at the central door, as usual, and going a certain distance toward either hand, we reach a point whence three corridors diverge, bringing all the apartments in connection with them within equal distance of the point of divergence.

This corresponds to the double primary mass with two appendages, *a*; or, if we prefer, to the single primary mass with two secondary masses, as at *c*; or to a single primary mass with two appendages and two secondary masses.

In passing from these to the arrangement of communications corresponding to triple primary masses, a difficulty is encountered which forms a curious parallel to the æsthetic hesitation arising at the same point, suggesting the possibility that the foundation of the æsthetic sense may ultimately be identical with that of the necessary physical constitution of the objects of that sense.

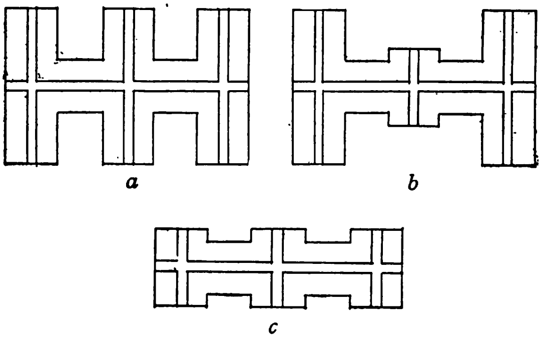


Fig. 128.
Modifications of plan that imply a triple external arrangement.

If we lay out such an arrangement as at *a*, Fig. 128, with the view of making one which shall be analogous to that at *b*, Fig. 126, and shall in addition correspond to a triple primary mass, we find that we have lost the logical idea in plan entirely. We find that, so far from securing short and easy communication, we have reached a most involved and roundabout arrangement; we cannot even reach the central point of the building without traversing the central corridor, and from the entrance to any extreme point, we are obliged to pass over three sides of a rectangle.

It is only when the central mass is of a different kind, either a more important part of the building, a nucleus of some sort, whether a "hall of wasted steps" or a many-chambered pavilion, that in itself constitutes the center of the building, that the triple mass becomes logical (*b*).

In such a case the central pavilion demands a different treatment from those flanking it, as much practically as æsthetically.

The alternative is shown at *c*; it consists in shortening all three of the cross corridors so much that they almost cease to be corridors, and become mere offsets from the main corridor.

In this case the three pavilions admit of similar treatment externally, with the same strong tendency of the composition to revert to a single primary mass with three secondary masses that the plan shows to revert to the single corridor with which we began.

These comprise many other arrangements which need not be separately enumerated; thus, an arrangement around a central open court is on the exterior suggestive of nothing more than the single corridor, or the rear view of Fig. 126, *c*. When any arrangement analogous to those of which we have spoken is under consideration, the external treatment at once suggests itself, but the convenience of having the possible variations of these labeled and pigeonholed in our minds is very great, and much time in fishing for a motive and arguing in favor of its practicability may be saved if some of the impossibilities are known and recognized in advance.

There are, however, many cases in which the lines of communication offer no suggestion as to the proper external treatment. Indeed, one of the most serious deficiencies of the utilitarian school of design is that only too often the most natural and straightforward composition is a perfectly plain parallelopipedon, with roof either flat, or of just enough pitch to shed the rain. Such was the cella of the ancient temple, in its simple form, and without the peristyle that was sometimes applied for its adornment. And very often in designing a modern building, whether a dwelling or a commercial structure, we find that everything naturally falls into the same oblong plan, with no need of any projection which might give a clew for the exterior.

When this happens we are forced to apply suitable architectural objects, whether secondary masses or details, according to the rules that we have been discussing.

Sometimes the exigencies of the plan require some special projection or other peculiarity which in turn will lead us directly to a natural and pleasing exterior, but frequently we are left with no such aid, and must invent a treatment to suit the conditions.

Take for example a case that is shown in Fig. 129. A country house of modest pretensions was comprised in a plan 36 feet square. There was no reason for making a material projection anywhere. The rooms were just right in size and relations. The result was at this point the packing box at *a*.

It would have been quite practicable and quite proper under some circumstances to have treated this as shown at *f*, with a portico placed at its front. The surroundings, however, would not have harmonized with such a scheme. It was a rustic, rural place, with wild woods about; the few houses in the vicinity roofed with pitched, shingled roofs in the most unpretentious cottage fashion, quite out of keeping with prostylar ordonnances.

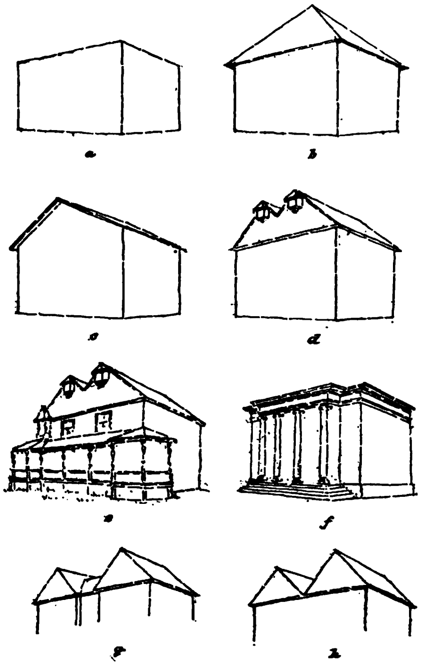


Fig. 129.
Modes of treating a simple plan by the addition of secondary masses.

As for a plain, straightforward hipped roof on our packing box, it proved unavailable, quite overpowering the house, and making the roof space of little use for the two or three servants' rooms that were desired.

A plain, straightforward gable was rejected for some of the same reasons, nor did a mansard seem to be quite what was needed; it became apparent after a while that a simple, single mass treatment of any kind would not look well.

The attempt was next made to divide it into two primary masses. This could not be done in the ordinary way as at *g*, as the frontage was not sufficient. It became necessary to dispense with the link and to join the masses by partial fusion, so to speak. It is rarely allowable to place two complete gables in contiguity as at *h*, as this gives the disagreeable effect of lack of connection commonly called "double composition."

The result was as is shown at *d*, in which little octagonal oriels have been added as two secondary masses. To still further soften any stiffness of effect a small octagonal bay was placed as a secondary mass at one angle, with the roof of a complementary pitch, and a pavilion, also polygonal, at the opposite angle of the veranda, giving at last a fairly satisfactory result; and one which astonished the owner, who wondered what was coming when he saw the packing box in frame. The horizontal line of the veranda is distinctly detrimental, but it could not be dispensed with.

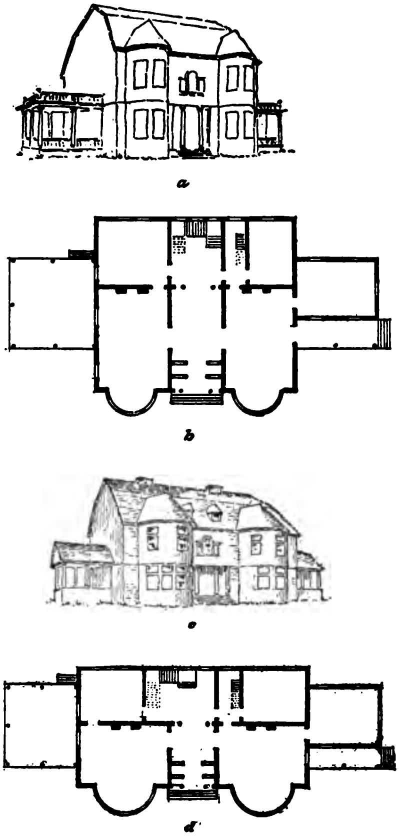


Fig. 130

Another example is shown in Fig. 130. In this case, although the plan of the house is a simple parallelogram, the naturally symmetrical disposition of the principal rooms offers a hint of a suitable treatment.

A bay on each side, carried through both first and second stories, seems to promise well. It will be observed that the single primary mass of the house is not, as in the previous example, treated as a double primary mass. On the contrary, it is allowed to remain unmodified, and the two bays are planted upon it as secondary masses.

At the first attempt some difficulty was encountered in harmonizing the dimensions of the bays with those of the front. The width of the rooms at the first laying out (*b*) was not sufficient to permit bays of breadth proportionate to the front, and the comparatively tall and narrow projections that resulted were eminently unsatisfactory (*a*). But by modifying the rooms themselves, increasing the width and diminishing the depth, space enough was found at last for the necessary breadth of the bays (*d*). This process not only permitted broader bays, but at the same time increased the length of the whole front, thereby still further assimilating its dimensions to those of the bays. Finally, by lowering each story a trifle, and bringing the eaves as far down as practicable, a satisfactory result was obtained (*c*). A circular plan was given to the bays as a contrasting treatment; a square or octagonal plan might have been used with good, but different, results.

Another motive which is very often available is the single secondary mass, whether suggested by the plan, or attached as an ornament, with some reasonable excuse if possible.

Take the case, shown in Fig. 131, in which the bald conditions of the plan are shown at *a*, the projection in front almost forcing itself upon us, no matter how we turn and manage the arrangement in an effort to get rid of it, for our preconception intended quite different motive.

It seems better, finally, to accept it as a necessary datum, and to make it the motive of the composition, which works out at last as at *c*. The projection we have carried up as a secondary mass, in this case an octagonal bay, contrasting with the main roof of the house. The difficulty here encountered lies in the fact that this projection is flush with the end wall of the house, a position in which it is always hard to preserve its character as a secondary mass. This is partly overcome by giving a slight batter to the walls of the bay, thus securing a break of four inches in the second story. The veranda at the south end we also make a similar octagon, and we place small octagonal hoods on each gable, which serve an additional purpose in protecting loophole windows that we wish to introduce in order to obtain a current of air through the vacant roof space above the attic. The completed composition constitutes a single primary mass, with a secondary mass, the octagon bay, upon it, and with two asymmetrical appendages, the extension and the veranda.

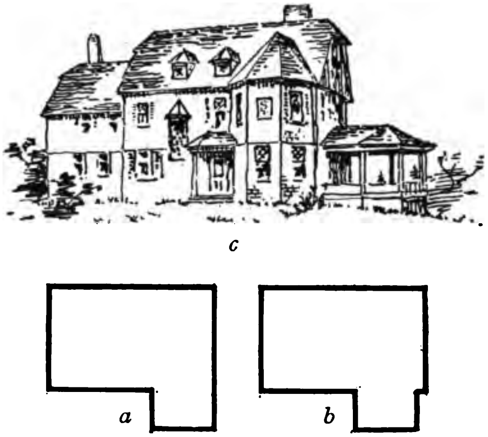


Fig. 131.
Treatment with a single secondary mass.

Such a secondary mass may be set asymmetrically, as in this case, or as the central feature: in either case, it is especially important that it be kept duly subordinate, as otherwise it is apt to assume the appearance of being itself the primary mass, reducing the parts of the building on each side to mere appendages.

Thus in Fig. 132, *a*, the pedimented projection is unsatisfactory: it is either too large or not large enough. It is too large for a secondary mass; the eye hesitates whether to regard it as primary and the parts on each side as appendages, or to regard the pedimented part as a secondary mass, subordinate to the primary mass of the building. In such a case much depends upon the projection of the central part; if the projection be considerable the subordination in height should be greater, that is, the more it projects in plan the lower should the central object be in relation to the main building. Whatever the projection, such an arrangement as *a* is unfortunate. It is better either to increase the size of the central part and insist upon it as the primary mass, deliberately reducing the flanking parts to appendages as at *b*; or to reduce the size of the central part, as at *c*, in order that its subordinate character as a secondary mass may be unmistakable.

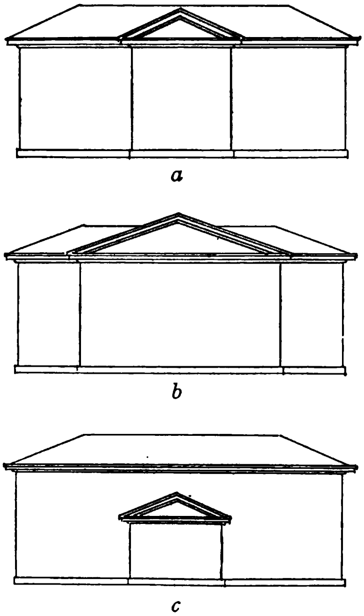


Fig. 132.

Relations of pediment to building are uncertain at *a*, dominant at *b*, subordinate at *c*.

To the mind of the designer who once becomes accustomed to the classification of parts of buildings and their combinations that we have proposed, the various groupings become a coherent series, to be looked over and one or the other selected, with as intelligent a purpose and as definite knowledge of their capabilities as is displayed by a carpenter in selecting from his chest a ripsaw or a backsaw.

The number of possible motives is exceedingly limited, but the number of their combinations is illimitable, as is the case in the works of nature.

They are substantially the same that we set down in classification of buildings in Chapter VIII, but it will be well to recount them here in slightly different form.

There is first the question of primary massing, which means the question whether we are to let the building alone as a single mass, or to try to divide it into two or three masses; and, if two, whether symmetrical or asymmetrical.

If we determine to let it alone, the next question is whether we shall adorn it with secondary masses, or again let it alone and treat it with details only.

The third step is to determine whether to apply a single secondary mass, or a pair, symmetrical or asymmetrical, or three; if indeed we have not adopted the alternative course, and let it alone for detail treatment only.

At each step, both of primary and secondary massing, appendages may be attached, either one or two, and the latter either symmetrical or asymmetrical.

This is absolutely all that is possible as far as massing is concerned, but, with these simple elements, what an infinite complexity of combinations may be compassed!

It may seem a bold statement to assert that any classification can contain all of the æsthetic possibilities, that feelings can be tagged and labeled and inventoried.

The only appeal is to the already experienced and skilful designer. Let such a one observe whether what he is in the habit of doing by instinct is not included in one or the other of these motives; let him endeavor to do something quite different from anything here outlined, and he will find that nothing else can be devised that is not incoherent and unintelligible, although perhaps romantic or picturesque, the latter qualities often existing where unity in the whole is wanting. Thus a collection of buildings may be manifestly a mere collocation of separate structures, yet the general effect of the whole may be picturesque and pleasing although no one would think of calling it a composition, in any but the broadest pictorial sense. On the other hand, a composition which is agreeable and yet lacking in unity usually presents the appearance of several different buildings standing close together.

Such are often the picturesque groups of buildings erected at various periods of which many English houses are composed; and it is difficult to separate the charm of romance, antiquity, and spontaneity in which they abound from that of coherence of motive, the true test of excellence of composition, in which they are often entirely lacking.

XV

ASYMMETRICAL COMPOSITION

VERY different from the picturesque but unorganized combinations alluded to at the close of the previous chapter, is organic but asymmetrical grouping, and by asymmetrical, we mean just now the visibly and conspicuously asymmetrical.

Professor Goodyear has shown, among his other brilliant discoveries, that exact symmetry, even in that which purports to be symmetrical, is not so pleasing as slight divergences from precise mathematical equality of the two sides. As soon as this is mentioned it recommends itself to the artist.

Such a design as that at Fig. 130 *c* is wonderfully improved if small differences are introduced. If one of the bays is fifteen feet across, make the other fourteen, and, keeping the roofs of the same pitch, let the ridge of one work out a few inches below that of the other. Make the room in which the wider bay occurs a foot or two wider than the corresponding room, thus bringing the entrance out of centre, and place the central window above it still a few inches more off centre. These divergences will be distinguishable only to a critical professional observer, and will often be overlooked even by him, while they will add incredibly to the softness of effect of the completed building.

In the house shown in Fig. 60, one of the oriels is a foot wider than the other, the octagonal veranda and window above are both slightly off centre, yet no one notices the irregularity, and the building is generally liked.

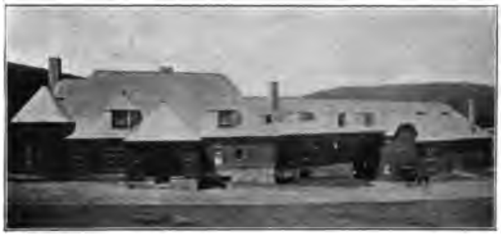


Fig. 133.
Primary mass with one appendage.

But we are speaking now of an entirely different sort of asymmetry—of the conspicuous and unavoidable kind, in which one part does not pretend to have an answering part at all, or none that can for a moment be supposed to be its equal.

The simplest of these asymmetrical motives, and one which occurs in all styles, and in all varieties of buildings, from the most rustic to the most polished, is the combination of a single mass with a single appendage.

From Fig. 133 to 136, inclusive, are given several examples, as diverse as possible in their uses and dimensions. In the first, Fig. 133, a stable, the part on the dexter side, that is, toward the left hand of the observer, with the hipped roof, rising to the highest ridge, is the primary mass; the part with the long and much lower ridge, running off toward the right, is the appendage.

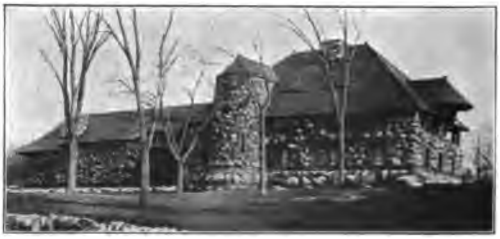


Fig. 134.
Gate Lodge, North Easton, Mass.
Single primary mass with one appendage.

Fig. 134 is a specimen even more rustic in execution, although devoted to similar purposes. It is a gate lodge by

Richardson, and it is built upon precisely the same motive, hipped roofs and all, only here the primary mass is at the observer's right, the appendage toward the left. In both this and the previous example there are various secondary masses which do not affect the main composition.

A much more pretentious building is shown at Fig. 135, a Chamber of Commerce building, in which the same motive is unmistakable. Here, however, the roof is flat, of the mansard type, the fact that the appendage is an appendage being indicated by a break in the roof, as well as in the plan, and by the difference in the details, three large dormers being used upon the primary mass, with only a half-suppressed one on the appendage. Although very different in character, it is evident that the general motive of the composition is precisely the same as in the two previous examples. No attempt is made to treat both sides symmetrically, although the building is in a style in which much stress is laid upon the importance of symmetry.

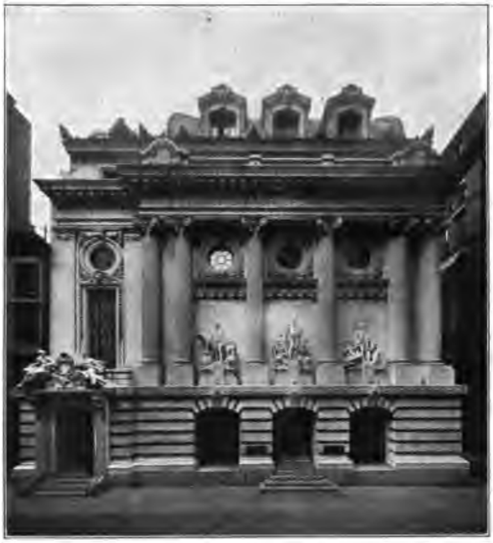


Fig. 135.
CHAMBER OF COMMERCE, NEW YORK.
Single primary mass with one appendage.

Still another specimen of this motive is shown at Fig.

136. Although devoted to perhaps less dignified uses, this far surpasses any of the previous in size, being a building of many stories, the abode of many families. The primary mass is at the left, the appendage at the right. The former is distinguished by a symmetrical treatment throughout, and by a very large, two-storied dormer window. The appendage is set off by a slight break in the plan; it has no corresponding part on the other side; and, most noticeable of all, the difference in the roofs is marked, the line of the ridge of the appendage being much lower, and a dormer of only a single story being placed upon it. It might have been possible to omit even this, or to reduce it to a mere bull's-eye, or pair of bull's-eyes, but for the real or fancied convenience of the tenants, who usually expect full-sized windows.

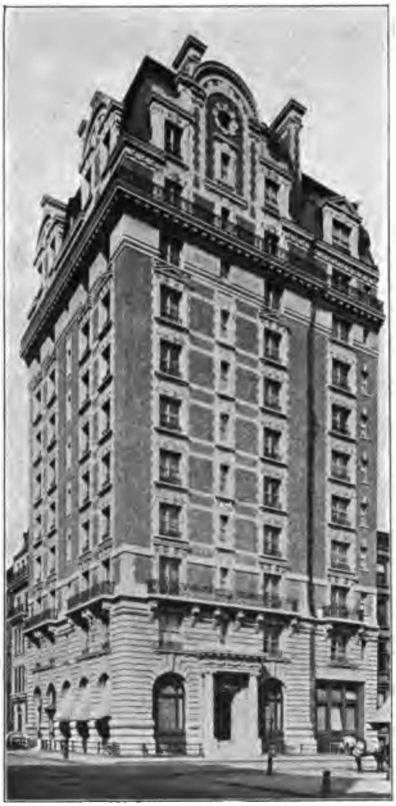


Fig. 136.
Hotel Essex, New York.
Still another single primary mass, with one appendage.

The last specimen of this motive that we shall give is shown in Fig. 137. It is especially intended to illustrate the adaptability of an asymmetrical motive to a large and involved composition.

At the right is the primary mass, with a long, straight ridge, elaborated with a great tower, broad but low, to harmonize it with the general horizontal treatment, which constitutes a secondary mass. This tower is indeed so large that it transcends the limit of size allowable for a secondary mass, and almost asserts itself as the primary mass. That it is really secondary may be tested by tracing the plate and omitting the tower, carrying the horizontal lines through and substituting details, dormers, perhaps, and a chimney, where the tower was. It will be found that the building retains its identity perfectly, demonstrating that the tower is really secondary in importance to the general outline.

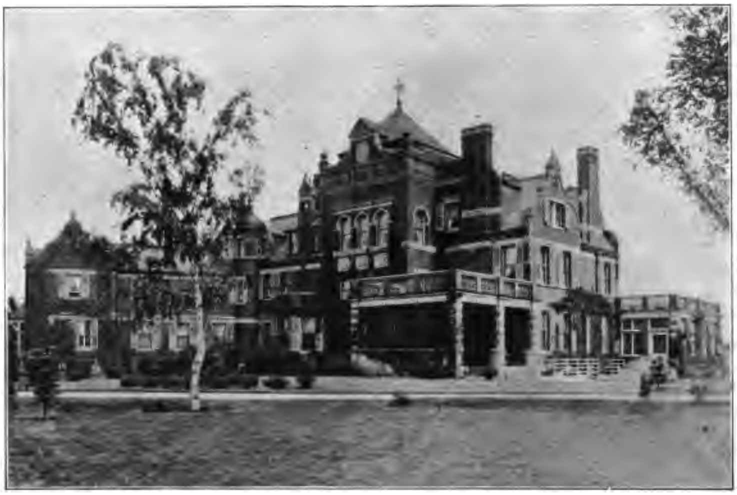


Fig. 137.

House at Kansas City, Mo.

A large and elaborate example of asymmetrical composition.

At the left of the spectator is the appendage, almost as long, but not nearly so high, as the primary mass. The line at the top of the first story runs through, but the cornice drops considerably below the main cornice, and the ridge still more below the main ridge.

The really important point is that symmetry, although pleasing, is not necessary to a high type of design.

Symmetry indeed may be compared to rhyme in poetry, one part made to answer clearly to another, honey-sweet indeed, but needing the hand of a master to avoid cloying our taste with its charm.

Or it may be compared to the quatrain stanza construction in music, in which the grandeur of a "Dies Iræ" may indeed be attained, but which must be transcended if a "Götterdämmerung" is to be accomplished.

Next in order to the motive that we have been discussing, is that of a single primary mass with two asymmetrical appendages, of which an example is shown in Fig. 131, the most serious defect being the disproportion between the appendage on the left and the primary mass. A longer and lower appendage is required, but was unattainable.

Both single and asymmetrical double appendages may be used with double or triple masses, of which one example is given at Fig. 138. This is an extremely complex and interesting group of two primary masses, the two main gables connected by a link, with the ridge line kept carefully a few inches below those of the gables. Upon this is placed asymmetrically a secondary mass, the octagon bay, with roof line harmonizing in elevation and contrasting in plan. That this is secondary in relation to the whole composition and not merely to the contiguous gable is evident, first from its size, which equals or even surpasses the gable in general effect of height, and also of projection; secondly from the care with which it has been separated from the gable by the vertical line of the chimney, instead of being joined to it by making the horizontal line continuous.

The farther gable, on the other hand, is itself a complex group of two unequal masses, a smaller gable being attached and bound to it by partly lapping over upon it, and by insistence upon the horizontal line at the second-story window heads.

To this unusually involved group are added two appendages, the farther one much smaller than the nearer; but the roof even of the nearer has the ridge kept down considerably below the ridge of the link. Notice, too, the way in which the dormers are placed upon this nearer appendage, a large and a small, assimilating themselves to the unequal gables of which the farther primary mass is composed. All this was done quite unconsciously of any purpose, and solely by the instinct of the designer. If we had asked him, "Why do you make this ridge lower than that one?" he could have made no reply, but that he thought that it looked better so.

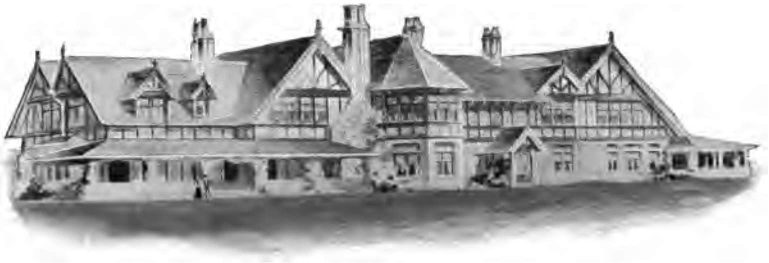


Fig. 138.
Two primary masses, with two asymmetrical appendages.

But when we find by examination of many examples that this is but one of many similar cases, in buildings of widely varying types, we are justified in making a general statement, and inventing a suitable nomenclature of classification.

This constitutes the reduction of architecture to a science, for all science is but the classification of facts and generalization of their relations.

Besides the combinations with a single appendage and with two appendages, a most useful asymmetrical composition is that of two unequal primary masses.

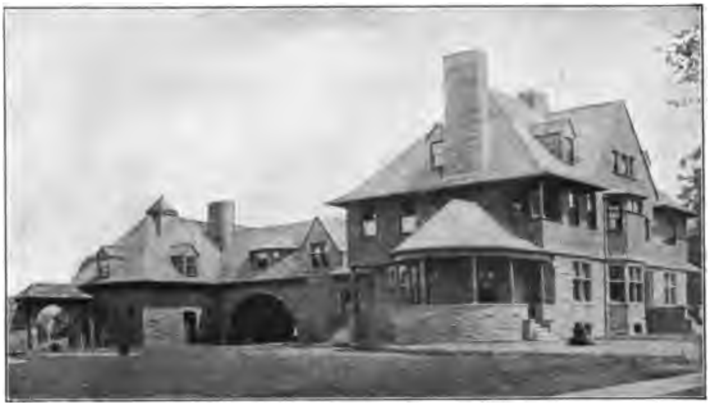


Fig. 139.
House at Detroit, Mich.
Two unequal primary masses.

It might be justly said, indeed, that this is the fundamental type of such compositions, as it is the only group of unequal primary masses which has been generally used.

We have already given illustrations of compositions of two unequal masses, both primary and secondary. We now add a few in addition to show the flexibility of the type, and its easy adaptability to widely varying conditions.

Two precisely parallel compositions are shown in Figs. 139 and 140, although the difference in the forms of which they are composed is complete. The contrast between the hipped roofs of the one and the broad, flat gables of the other is not more striking than the absolute analogy of their arrangement.

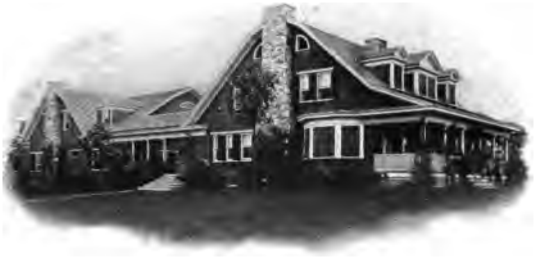


Fig. 140.

Two unequal primary masses, a close parallel to Fig. 139.

Even in the minor parts a curious likeness prevails. Note the great central chimney in the middle of the front of the larger mass in each; and in each the bay, projecting forward as a single secondary mass, at an exactly corresponding point in plan. How easily could one be changed into the other, without disturbing in the least the interior domestic affairs. The styles are different: the motive is identical.

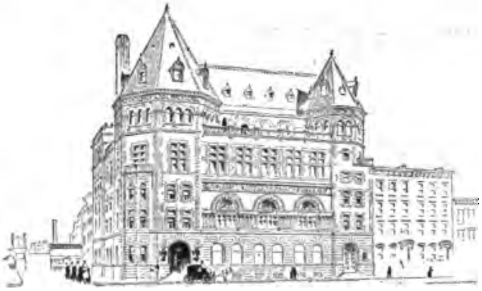


Fig. 141.

Two unequal primary masses. Note the disproportion between masses and link.

Another example is given at Fig. 141, to show the availability of the motive for less rural structures. In this case it well interprets the uses of the building, as the smaller mass marks the less important entrance, which leads only to the public hall in the second story, indicated by the three large windows; while the larger corresponds to the main entrance to all the rest of the building.

One or two other points are illustrated in this example. The first is that it is not necessary to have either the entrance or a central feature placed upon the link; the entrance may be as well in either mass, or as here, there may be entrances in both.

The second relates to proportion. The second story of the link, in which occur the three windows of the auditorium above mentioned, should have been farther back, on a line with the wall of the upper story. The space, however, could not be spared. The result is seen in the too massive, square-shouldered appearance of the whole. It is caused by the fact that the rectangle of the link between the lines of the towers and up to the point where the wall stands back, is quite dissimilar to the rectangles of the two towers.

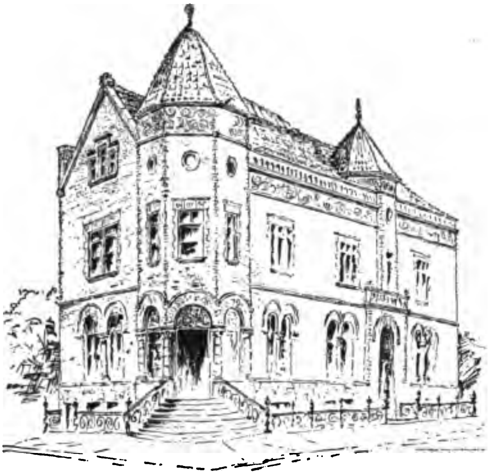


Fig. 142.
Two unequal secondary masses.

Another defect in proportion, of less magnitude, is in the relation of the front faces of the octagons above the line where they begin. Although the cornice line of the smaller tower has been lowered a little, it has not been lowered enough, and the effect of a height greater than that of the larger tower still remains and grates upon the sense of the observer.

The last of this type that we shall give is at Fig. 142, a sketch for a building that was ruined in the execution. The octagon tower on the corner comes naturally enough in connection with the plan as the proper place for the entrance to the banking room in the first story. The upper stories are laid out as offices, and the entrance to these at the side, three-quarters of the way toward the rear, is marked as naturally by a reflection of the larger tower, built on purely for adornment, although eight inches was the greatest projection that could be obtained.

Both towers are so much subordinated to the main roof of the building, that they can rank only as secondary masses, the first instance of the kind that we have discussed.

We might go on and show examples of variously complex arrangements of secondary asymmetrical masses, with their asymmetrical details and appendages, but enough has been said to suggest to the student the point of view from which he may analyze for himself the most involved examples.

XVI

FLEXIBILITY OF TYPES

THE practical work of designing a building consists in adapting the plan to a suitable external motive; or in adapting the external motive to the plan, whichever statement may be preferred. In point of fact both operations proceed simultaneously and almost instinctively; in this work a clear conception of the connection of the various possible types of exterior compositions is of much assistance.

Each type may be regarded as derived from a preceding type and all may be traced back to the primitive single mass type, from which the more complex forms are conceived to be built up by a process of accretion, the additional members being added consecutively, one by one.

If we begin with the simplest kind of building possible, a parallelopipedon with door, windows, and cornice—a single primary mass—Fig. 143, *a*, the first modification that is possible with parts of the same order is the extension of a single appendage, as at *b*.

This gives us an asymmetrical group, and one which, as we have seen, is used and approved by all schools of design.

When the exigencies of the plan require it, this appendage is separated from the primary mass, remaining connected with it only by a link, as at *c*.

The beginning of this process may be seen in Fig. 115, in which the link has as yet hardly become a link, the appendage has barely become detached; indeed this building has been examined heretofore without any suggestion of this incipient separation.

At *c* the separation is complete, and a composition of

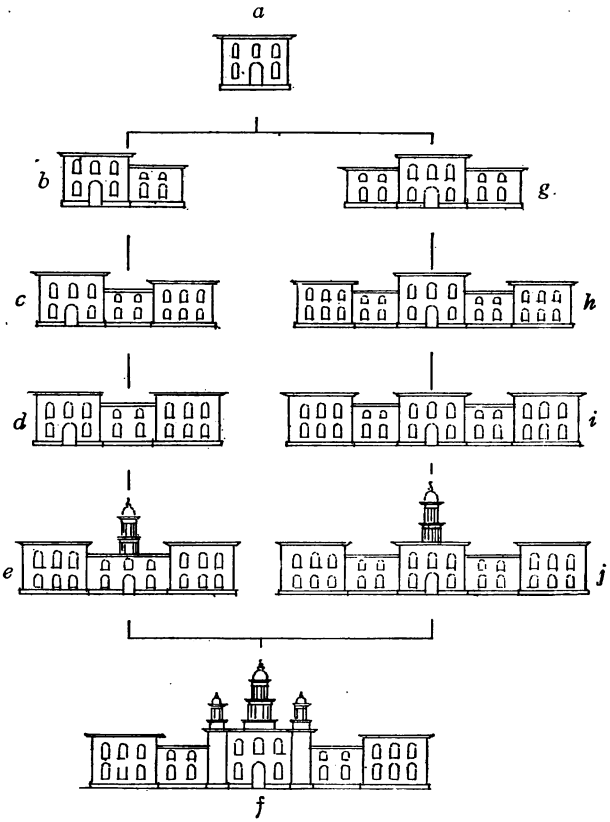


Fig. 143.
Development of one type of composition from another.

two unequal primary masses, connected by a link, is the result. Any distinguishing secondary mass, such as a turret or belvidere, is naturally placed upon the largest of the two masses, or on both of them, but a distinguishing detail, such as a doorway, may be placed either upon the masses or the link.

If the smaller of the two masses be increased in size it ultimately becomes equal to the larger, and a group of two equal masses is formed (*d*). In this stage the doorway, or other tertiary part, may still be upon either or both of the masses, or upon the link, but a tower, or secondary mass of any kind, if placed upon one mass, must be repeated on the other also. Usually, however, such secondary mass is better placed upon the link, as at *e*, especially when the link is increased in height to that of the masses, which is not shown in the diagram. As the link grows in importance, it may itself become the central mass of a group of three, the flanking masses being now separated from it, remaining attached only by links, as at *f*.

Going back to the beginning at *a*, we may make the first addition two appendages as at *g*, instead of one, and these may be either symmetrical as to their size, or asymmetrical as we may prefer, of which only the former type is shown.

At *h*, which is the next stage of development, the appendages have been moved away from the primary mass and have assumed an individuality of their own, attached still by links, and still remaining inferior in size to the central primary mass. Here again only the symmetrical type is shown, although the flanking masses may be asymmetrical in size. Examples of this, however, are rare. Whatever contrast in size is admitted, substantial similarity in shape between them must be retained.

In this condition the composition is entirely analogous to the corresponding two-part group at *c*. Both are complete and satisfactory, and capable of great variation in the size of the added masses in relation to the original mass.

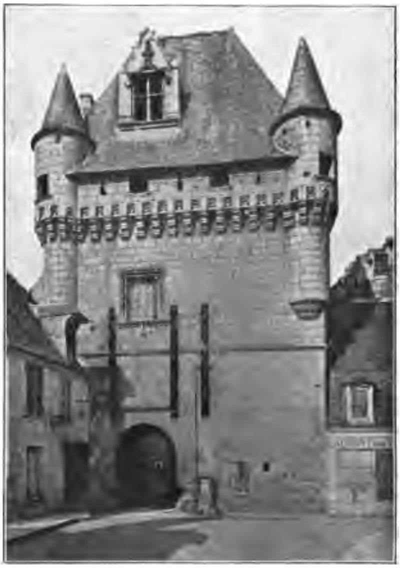


Fig. 144.
PORTE DES CORDELIERS, LOCHES.
The two turrets are unmistakably secondary masses.

As long as they remain smaller no especial distinction of form is felt to be necessary; the distinction in size seems to be sufficient to concentrate the attention on the largest and to give the required unity of impression. It is true that if any detail is needed, as a doorway, it is most naturally placed on the largest mass, but beyond this the eye requires a general similarity of form in all of the masses. When equality of size is reached as at *i*, a sense of dissatisfaction occurs: the three masses stand apart and need to be in some way drawn together. We try the addition of a secondary mass, as at *j*, just as we did in the case of the double group, with a result only partly satisfactory, as a curious effect at first follows the experiment. The addition of the turret, instead of giving apparent additional size and dignity to the central mass, actually causes it to appear relatively smaller, and every additional detail seems to diminish still more its size. We are compelled finally to restore the preponderance in size to the central mass to enable it to support the added enrichment, reaching a final stage at *f* identical with that obtained from the double group.

The combinations shown in these examples comprise all the fundamental arrangements of masses that are possible. To all of them, except *b* and *g*, appendages may be added, which may again be separated by links, giving rise to another series of compound compositions, entirely analogous to the original series, but of which each individual part is a composition in itself of one of the types here shown.

An equally interesting and profitable series of changes and connections may be shown in the conversion of secondary masses into primary, and the reverse.

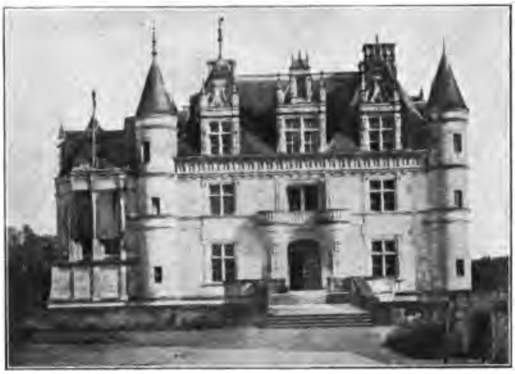


Fig. 145.
Château de Chenonceaux.
Although increased in size the two turrets are still secondary masses.

At Figs. 144, 145, 146 are shown three buildings illustrating the growth of two secondary into two primary masses. In the first there are two turrets, springing from corbelling nearer the top than the base of the rectangular building on which they are placed. They are altogether secondary in character, their bulk so inferior that they might be removed entirely without any loss of identity to the building.

At Fig. 145 a pair of the same sort of round tourelles is seen, increased considerably in relative size, yet still unmistakably secondary, and quite subordinate to the primary mass.

Finally, at Fig. 146 the round towers have reached their full size and have in turn become primary masses, the building proper having dwindled to a mere link between them.

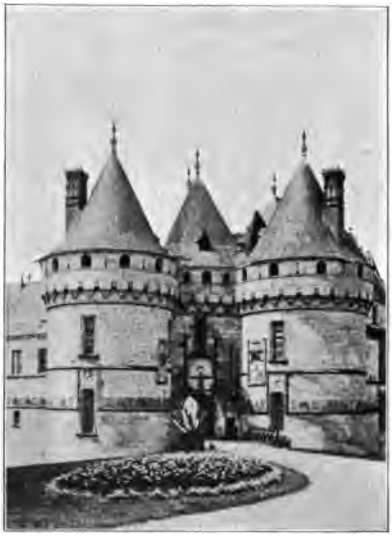


Fig. 146.

Château de Chaumont.

The turrets are here increased in size until they have become primary masses.

This change of secondary into primary masses is of continual service in the designing of modern domestic work; and the conditions of plan that require one or the other very soon become a matter of instinctive feeling.

It is very difficult, for instance, when the plan requires such a projection as that shown at *a* in Fig. 131, flush with the end of the building, to make anything of it as a composition, but a single primary mass with an appendage. If this is done, the difficulty then encountered is that the appendage is too large to be properly subordinated to the mass, the latter being fixed by the limited width of the projection.

Whereas if a break can be arranged in the plan, as at *b*, between the projection and the body of the building, there is no difficulty at all in treating the projection as a single secondary mass as is done in the final result at *c*.

When the secondary mass is a central one, a gradual increase in size tends to change the primary mass of the building into two appendages.

This process is shown in Fig. 147. At *a* the colonnade is altogether subordinate, unmistakably a secondary mass upon the primary mass of the building.

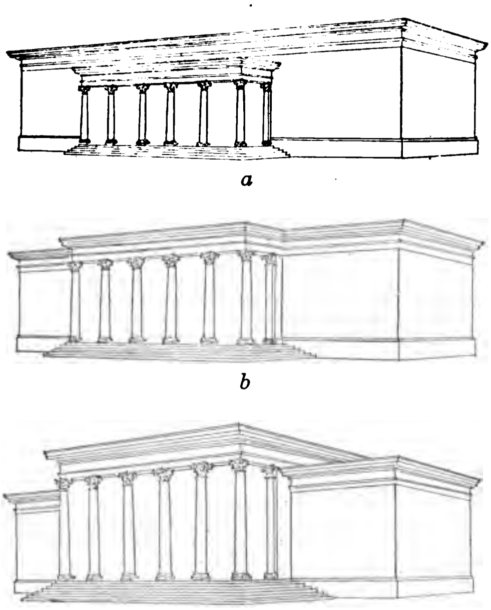


Fig. 147.
Varying relative importance of colonnade from secondary at *a* to primary at *c*.

At *c* the colonnade has grown into the primary mass itself, the building being subordinated as two appendages.

At *b* is an intermediate stage, in which the subordination of one part or the other is not sufficiently well marked for a really satisfactory result, it being hard to say which is meant to be primary, the building or the colonnade.

Although this intermediate form is frequently used, it will be found that it always makes a more spirited composition if it is changed so as to resemble *a* or *c*, in which the character of the central mass as either primary or secondary is unmistakable.

If the central part of the façade is advanced, while the cornice line is kept uniform, as at *b*, it is apt to detract from the importance of the whole building without sufficiently atoning for it by any added importance of its own. It is far safer either to run the cornice line through on a straight front, letting the projection top out below it as at *a*, or to boldly carry up the projection, making that the principal mass of the composition, as at *c*.

With a little practice, it will be found that all of these things will take care of themselves in the study of the possible variations of a composition. Indeed, as soon as the sentiment of the laws of composition is acquired, its execution becomes spontaneous and unconscious, as is the case with all arts after once the skill has been gained: the dancer never thinks of the position of his feet, nor the musician of his fingers.

To show how completely one thing follows another as an almost necessary implication, observe the stages of change in the same composition that are shown in Fig. 148. At *b* is the same house as at Fig. 60, only drawn sketchily to compare on equal terms with its derived forms *a* and *c*. This design, it may be mentioned, is of peculiar interest, as it is the first design that was made through the conscious application of the various laws of composition that we have formulated, although many had been made with a dim, gradually awakening apprehension of the fact that there were laws.

As it stands, it forms a composition that is actively pleasing to almost everybody, consisting of a horizontal single primary mass, with two secondary masses in the upper story and one in the lower. The intention was to give it as marked a horizontal character as possible. The most serious deficiency, felt to be so at the time, is the shortness of the main ridge. This might have been much improved by making the pitch of the end slopes steeper than that of the front slope of the roof; but country carpenters have an invincible prejudice against such trifling with the regular mitre line and the unevenness of the shingle courses that results.

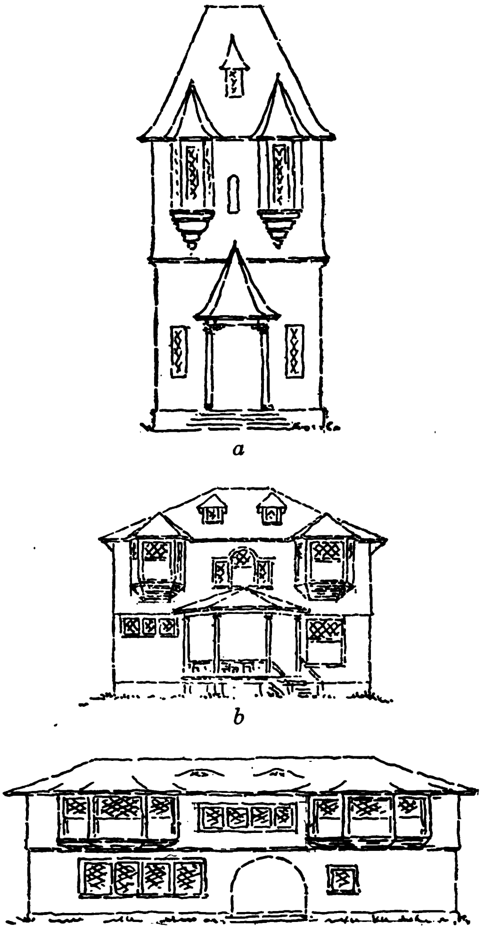


Fig. 148.
Spontaneous modifications that accompany fluctuating dimensions of a building.

Now, if it should be desired to keep the same motive in a building of more individual, vertical dimensions, a general extension vertically must take place. The pitch of the main roof must be raised; that of the oriel and porch roofs raised to match the main roof; the corbelling under the oriels prolonged to match the roofs, and the central detail that connects the oriels modified to suit the more contracted space between them.

The process ends in a perfectly harmonious building of tower-like appearance, though hardly available for modern use as it stands, except perhaps as a pavilion of a larger composition, of which it might be a part.

On the other hand, if the conditions, such as additional land that may be used, larger rooms needed, lower ceilings and a more rustic character wanted; if such conditions require a more marked horizontal character than that of *b*, the result is exactly the opposite. The main roof pitch is lowered as much as we may venture, the oriel roofs are flattened as much as possible, and the porch itself is abandoned in order that the marked individuality of a conspicuous single secondary mass may not conflict with the continuity of the whole composition. The window details that connect the oriels are lengthened out horizontally and are made of even number toward the same end, terminating in a structure well suited for a cottage, and just as harmonious in itself as either of the previous modifications.

Both the vertical and the horizontal lengthening-out process is done without a thought of exact measurements, of precise equalities of ratios, or of any of the other laboriously extracted qualities that we have analyzed.

All goes on cheerfully and hopefully, with the aid of a soft lead pencil and plenty of tracing paper, only the eye and the feelings guiding us, except possibly in some special contingency when the solution is not spontaneous, or in the case of a larger and more complex building, when a few rules to illuminate the artist's instinct become as useful as are now and then the rules of perspective to a painter.

XVII

COMPARISON AND CRITICISM

EVEN for those who are not designers and never expect to be, but who wish to know how to criticise a design intelligently, the generalizations that we have made in the preceding chapters will be of infinite service.

Generalization means comparison, and comparison means observation; and he who has learned to observe and compare is in a position to verify the general statements that have been made, and to criticise rationally and not arbitrarily. The power to judge comes with the power to observe and classify, so that the readers of these pages who have no intention of becoming designers may at least become capable critics, who are quite as necessary for the prosperity and progress of the arts of design as are the designers themselves.

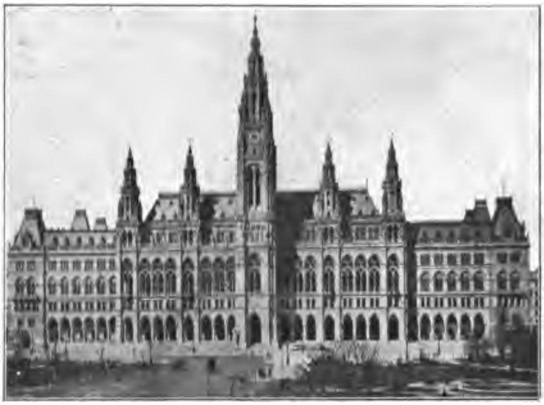


Fig. 149.

RATHHAUS, VIENNA.

The serious defect is the antagonism between the vertical parts and the general strongly marked horizontal disposition of the building.

After what has been said, it will be easy for any one who has fully digested it to recognize parallel motives in the most diverse styles, and to note at the same time the minor differences. Soon will come the power to weigh these differences, assign their causes, and estimate their value; so that the bare statement "I think this is prettier than that," which is the sum of artistic criticism to-day, may give place to "This is prettier than that, because of such and such characteristics."

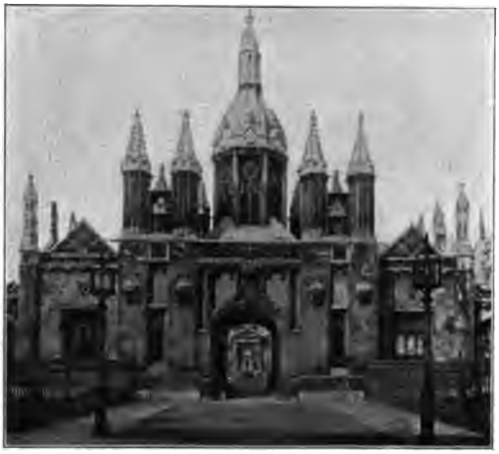


Fig. 150.
GATEWAY OF KING'S COLLEGE, CAMBRIDGE.
In composition closely parallel with Fig. 149.

Take, for example, the two buildings shown in Figs. 149 and 150.

These differ widely in dimensions, Fig. 149 being a building of many stories and heterogeneous uses, perhaps five hundred feet in length, with a central spire of three-fifths that in height; the other (Fig. 150) a mere gateway, perhaps seventy-five or eighty feet in both width and height; they are separated by about three centuries in time and a thousand miles in space; yet the designers of these have hit upon an arrangement in each case, which, however different in detail, is virtually identical in general conception.

In each case there is a central mass, with an appendage on each side. Upon each central mass there is a group of five secondary masses, spires in one, pinnacles in the other. At the termination of each appendage is another secondary mass, a pavilion in one case, another pinnacle in the other. The precise correspondence is remarkable.

As for the minor differences, and they are many, it is not our purpose to dwell upon them now, it is the extraordinary likeness that we wish to remark,—the larger central secondary mass, flanked by a pair of spires or spirelets on each side, and other secondary masses bounding each composition and attached to the main group by the subordinate parts that we have called appendages.

The faults of both are those incident to an impure style. The earlier gateway is in the Gothic of the sixteenth century, when horizontal details were beginning to displace the pointed; the city hall is a nineteenth-century combination of horizontal masses with vertical Gothic spires. Purity of style is not a thing to be revered or slavishly observed, especially where a transition style, the purity of which lies in its impurity, is in question. Purity, properly used, means that harmony which is secured by the carefully worked out similarity of all parts, both masses and details, until one type dominates the whole.

Of such a style as that of the period of François I, which is a mere picturesque grafting of classic details upon a Gothic body, it is vain to demand purity as a necessary characteristic, while that of the time of Louis XV, however objectionable on the grounds of extravagance and lack of delicacy, may properly be called pure, as all the parts share the same character.

So in both the above examples the chief criticism will be the lack of similarity in the horizontal and in the pointed or vertical parts. The five tall, narrow, secondary masses directly contradict the general horizontality of roofs and mouldings, while there is no army of little pinnacled buttresses as in the true Gothic to justify and harmonize the larger spires.

Another serious defect is the use of five secondary masses. This is partly atoned for in Fig. 145 by the difference in form of the central one; but in Fig. 144 there is not even this to excuse it. The result in both cases is a loss of the unity that would be felt if only three were used.

The next case, for criticism only, not for comparison, is shown in Fig. 151, and it is an admirable example of almost all possible blunders in composition. The building from one standpoint is of predominantly horizontal character, completely girdled by two heavy cornices and partly by a third. From another point of view the composition appears to be a vertical one, as it is cut vertically into various parts, marked strongly enough to constitute a primarily vertical composition, if they were not contradicted by the strong horizontal cornices. The fundamental error is here touched, in that there is no clear conception of what character the whole design is intended to have.

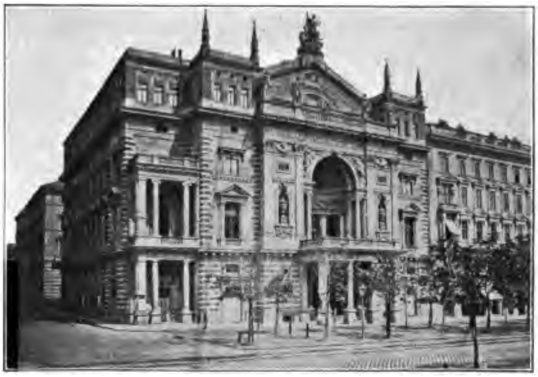


Fig. 151.
RING THEATRE, VIENNA.
All the parts are contradictory.

If it were meant for a horizontal composition the very marked vertical break in plan at the corner should not have been so marked; or rather should not have occurred at all, nor should the twin tower-like treatment of the front have been attempted; if vertical, the vertical breaks should have been more strongly marked; the lines of the towers carried down to the ground, the loggia which forms the link set back, and the projecting part, formed by the break at the corner, cut down in height, to reduce it to an appendage, and the horizontal mouldings much diminished in projection.

A double course is always open to the designer in every part of every composition, and a criticism, to be of value, must point out, or at least imply, the alternative. The author has been asked to give an example of a perfect composition: this, however, is impossible; for every composition has an alternative, and when a difficulty is reached in the working out that seems insoluble, the chances are that we are trying in the wrong direction, and that an experiment should be made in just the opposite way.

Assuming that a vertical composition is to be made, the first fault is, and it is a serious fault and a frequent one, that the central portion, with the great arched loggia, that connects the two towers, does not properly connect them at all, but is pushed forward as if it were the principal part of the composition. It might indeed be made so, but in that case the tops of the towers must be cut off and various other things done to make the central part duly predominant.

Taking it as a connecting part between two masses, it is absolutely essential that it should not advance by even an inch in front of the masses which it is to connect. If it does, again we have that fatal and hopeless condition of not knowing what we want to do, and of course not doing it. First, we have sinned by not knowing whether we wanted a horizontal or a vertical building; and now we sin by not knowing whether it is to be of one or two primary masses.

Again, we must realize that, to exist at all harmoniously, the part at the left may exist only as an appendage, a hanger-on, subordinated in height as well as in plan to our main group.

It is impossible to pile it up to the same height as the tower; we must cut it down at least to the level of the main cornice; it would be better if it could be cut down still further, to the height of the pretty little open colonnaded corner porch, which we must try to make the really effective appendage, if we can suppress the aspiration of the one in the background by even an attic story. And if this cannot be done, if the space it incloses is really indispensable, the motive of the whole composition must be changed, the vertical type relinquished and an entirely different one tried.

As for the large central gable half seen above, we hardly know what to do with it. It may not be entirely removed, as that part of the working arrangements inside, we know, cannot be dispensed with. We must be content if we can work it a foot or two farther back in plan, or hip the roof back to do away with the impertinent pediment, and raise the flanking towers above it by even a little; get it out of sight in some way, as best we can.

Finally, comes the sin against proportion in the narrowness of the towers, which has no likeness in the broadness of the central motive.

It might be possible to establish a very passable relation of similarity between the dimensions of these towers and of the whole first story front below the stringcourse; but such a suspected harmony is partly masked by the superfluous portico.

Embodying all of these suggestions in a concrete sketch we see the result in Fig. 152.

In this the link stands back a few inches as it must, with an immediate improvement in effect. The towers are widened a little and the portico removed, bringing towers and first story into some approach to proportion. The towers are lined across by a moulding between the first-story string-course and the main cornice, dividing the height into three parts, which bear some proportionate relation to the part of the link above the first-story cornice.

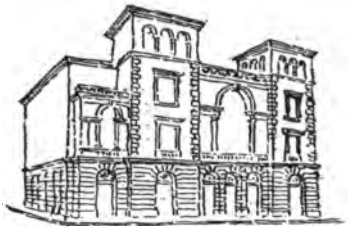


Fig. 152.

Modification of Fig. 151 to secure a definite motive of two primary masses with an appendage.

The pediment is suppressed out of sight and the appendage cut down one story, trusting that what is left of it will not be much noticed, and the pretty little arcaded appendage is treated in a way that suggests the great loggia, giving the added charm of similarity.

If this solution proves unavailable, on account of the lost space in the attic of the appendage, or for other reasons, we must reject the whole scheme for a vertical composition, and work up the alternative horizontal arrangement.

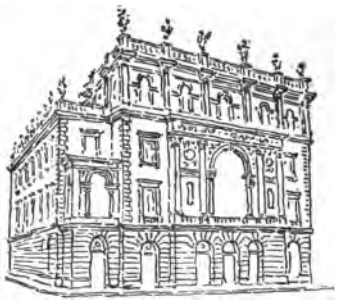


Fig. 153.

Modification of Fig. 151 in an opposite direction, to secure a single, continuous, primary mass, with a single secondary mass, and an appendage.

The tower idea must be eliminated and the roof of the attic carried through. This with the other necessary modifications is shown in Fig. 153. This disposes effectually of the troublesome gable; what little may project above the flat roof is too low and too far back to be visible from the street, and it is a false system of composition that demands the exhibition on the exterior of some symptom of every internal arrangement. Where the internal arrangement suggests the neatest and most straightforward motive for the exterior, it is naturally the best motive that can be adopted; but where the internal arrangement is so involved that the external expression is difficult, some other motive may be better.

In this case, for instance, the gable appears to be the front wall of the auditorium of a theatre; the wall of the façade evidently incloses the miscellaneous collection of lobbies, corridors, foyers, ticket offices, and such, which are indispensable in a modern theatre. If we had the plan before us, and were at liberty to remake that also, it might be well to attempt to reduce the foyer and other appurtenances to a smaller space, to fill out the break in plan at the corner, and to make the auditorium gable the predominating motive of the composition.

But taking the data of the plan as they are forced upon us, it is our task now to do the best that we can with them, without radical change.

The next end for which we must strive, is the subordination of the appendage. It is impossible æsthetically to carry its cornice through on a level with the attic cornice of the main building. We must reduce the height of the former and increase that of the latter by every means in our power.

Accordingly, we keep down the roof of the appendage, drop the window heads, remove the parapet, lower the story height if necessary.

On the main mass we do just the opposite, to give all the additional height possible. We put on a balustrade, as high as we dare, and if necessary raise the whole cornice.

The next step is to treat the attic with a continuous treatment of pilasters, around which the attic cornice breaks. Now is the time and place to put our statues—not pinnacles, such as are used in the original design,—which are clearly out of keeping. Along the whole front we place them and along as much of the return above the appendage as can be seen, to give the appearance at least of a complete row along the whole side. One is placed at each pilaster, carrying up the vertical lines of it, all still in due harmony with the horizontal feeling which the even horizontal rows of both statues and pilasters produce.

Almost the only semblance of a pinnacle that can be used with the horizontal styles is the human figure, and this because it is not so very much of a pinnacle after all, but more suggestive of the shape of a vase, small at the foot, large at the shoulder. Even statues are best used in long rows, where the continuity of the whole is the prevailing effect. It will be observed, too, that it is difficult to place a row of statues immediately upon a heavy, unbroken, main cornice. Usually, as in this case, an attic intervenes, cut up by pilasters, with its own lighter cornice breaking around, and forming an intermediate, half continuous, half vertical, podium upon which the row of statues may stand.

Below the main cornice the building may stay nearly unchanged. The central pavilion with the open arched loggia falls into due subordination as a single secondary mass, and into proper proportion with the whole front.

In the first story we may allow the portico to remain if it must be, as it is not fatal to the composition in this case, although not an improvement. We insist, however, upon carrying the rusticated treatment of the first story through the portico also, in order not to interrupt the continuity of the motive.

It will be as well in this case, as in the former, to make the open porch in the angle an arched motive in the second story, similar to that of the great loggia, and a like treatment for the windows of the attic will improve the appearance of the whole.

If it were possible to dispense with the attic entirely, a third, and fairly satisfactory solution might be reached by removing everything above the main cornice. Cover that portion and what remains is a coherent composition. The central part then becomes a secondary mass; and the small loggia at the left declares itself as the effective appendage, being large enough to throw the part above it into the background. Indeed the building as it stands looks as if the attic story had been added afterwards.

The next example, at Fig. 154, so far from being seriously faulty, is a fairly correct and creditable performance, open only to minor comments. It is introduced to show how much better results may be obtained from this frequently used arrangement if it is swerved a little, one way or the other, in order to give more coherence to the parts, that is to say, unity to the composition, for which we are always striving.

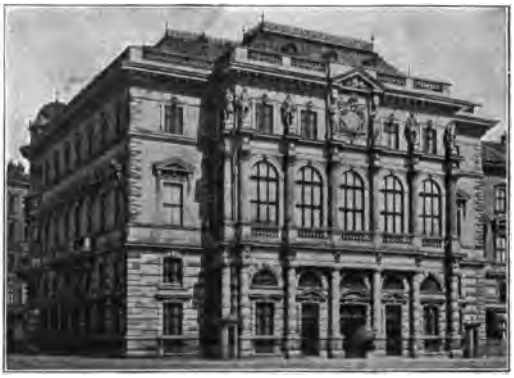


Fig. 154.

Palace of Ludwig Victor, Vienna.

The conspicuous defect is the lack of subordination of the central pavilion.

As it stands it is composed of a plain, solid, square mass behind, in front of which is placed a flat frontispiece, much richer than the main building, and extending as high as the main building itself. Now the most untutored eye will see that this frontispiece causes a serious interruption in the line of the main cornice. It is not clear whether the pieces of it that appear on each side indicate the boundary of the main house, and the enriched frontispiece is merely applied to it; or whether the frontispiece itself is the main mass, and the parts on each side appendages of it.

Neither building nor frontispiece is subordinate to the other.

Almost all of the errors in composition that are made arise from this very cause, that the designer is not clear as to what is to be done and in consequence adopts a doubtful middle course, trying to do two opposite things at once and failing to get the full effect of either.

The one rule for composition is that the designer shall make up his mind to whatever motive the physical requirements of the plan point, and devote himself to the clear expression of it, restudying and if necessary modifying features of the plan that conflict with it.

Very often such a process results in great improvements in the plan itself, and both plan and exterior should seem so simple and inevitable when completed, that to the uninitiated it will be incredible how many weeks of work have been lavished upon them.

In this design, and it is but one example of many instances, for nothing appears more obvious than to advance a little the central enriched part of a building, there are as usual two modifications, either of which is capable of producing a more coherent composition.

In the first, Fig. 155, the frontispiece has been kept down, and made a distinctly secondary mass, in proper subordination to the primary. The gain in coherence is at once seen. It would be very desirable also to lower its cornice as its proportions are not those of the primary; it is somewhat too tall in comparison. This, however, we cannot venture to do without some opportunity of revising the plan to correspond.

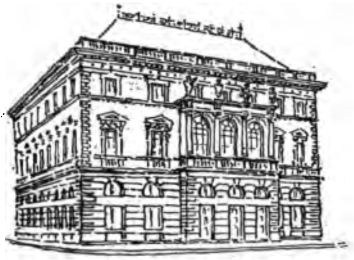


Fig. 155.

Modification of Fig. 154, reducing the central portion to a definitely secondary mass.

If we prefer to make the opposite modification, we shall have some such result as Fig. 156. In this the central frontispiece becomes the primary mass, and the cornice is returned for the full depth of the building. From the side parts the upper story is cut off, reducing them to subordination as appendages, the roofs of which are made similar in character to that of the primary mass.

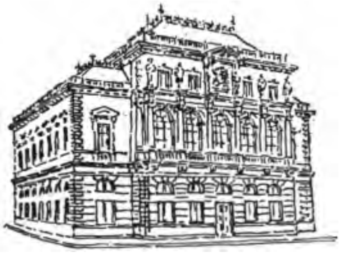


Fig. 156.

Modification of Fig. 154, increasing the central portion until it becomes the primary mass.

The coherence again is perfectly clear, clearer perhaps than in the first modification; but so great a change is involved in the plan, in cutting off so much of the upper story that in practice this second transformation might be unavailable.

A more serious defect from the æsthetic standpoint is the disproportion that exists between the primary mass and the appendages.

The latter are far too narrow to present any approach to similarity with the main dimensions. If one or two more windows in breadth could be added to each, a far more harmonious result might be attained. It is impossible, however, to do this without losing the entire outline of the original building.

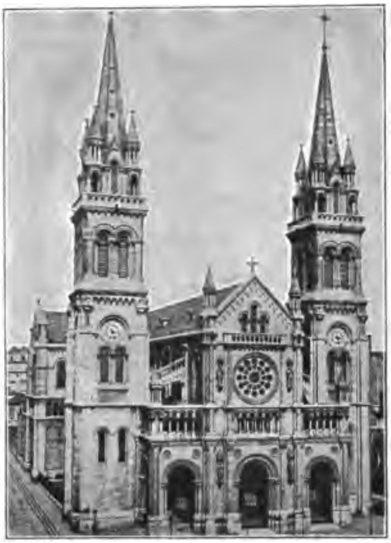


Fig. 157.

The serious fault is the prominence of the nave and narthex, making it too conspicuous for a link, but not enough so for it to become itself the single primary mass.

The last example that we shall consider is shown at Fig. 157: a church, at first glance of the usual type, with twin towers and a gable between. A second glance shows that a curious dislocation has taken place, the gable is pushed forward very much in front of the two towers, while the towers have drawn away sidewise, to the greatest extent possible without losing all contact with the building. It looks as if a force of repulsion animated the parts and drove them asunder, a result quite destructive to a sense of unity, which demands their approach and close connection.

This is the same sort of mistake as one of those mentioned in connection with Fig. 151, the pushing forward in plan of a part whose only proper function is that of a link to unite two masses, and by its nature to be subordinated rather than made prominent: there, however, the pushing forward was measured by inches; here it is fifteen or twenty feet, and proportionately a greater shock to good taste.

It is an error arising from failure to understand that a composition may be one of two masses, or one of three masses; but it cannot be both at once.

If it is to be one of two masses the central part cannot be anything but a connection between them, on pain of losing all connection and all sense of unity, as here occurs.

On the other hand if it is to be three masses, the central must dominate either in height or bulk, but never in projection, because by such projection one or the other of the two remaining masses is more or less cut off and its importance as one of three masses diminished; unless, indeed, the two flanking masses are to be relegated to the position of secondary masses, and then the central mass may stand in whatever position in plan we may prefer.

But it will do little good here to place the gable back on the line of the face of the towers, unless we can in some way obtain a better connection between it and the towers than is afforded by the one-story high, horizontal line of the balcony of the narthex, which then will become that of the front itself.

This connection may be improved, it is true, by continuing the small arcade across the fronts of the towers, and putting another arched doorway in each tower, making five instead of three arches; but there would still remain, standing upon this coherent, horizontal base the three disconnected upward projections of the towers

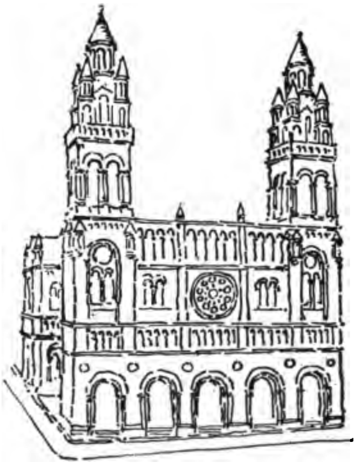


Fig. 158.
Modifications of Fig. 157, to obtain a more coherent result.

and the gable, open to precisely the same criticism as before.

If to overcome this state of affairs we determine to construct a horizontal line across the gable, as is done in Notre Dame at Paris, as shown at Fig. 158, we at last gain unity, as far as the proper connection of the parts is concerned, but there is a total lack of proportion between the broad mass of the central link and the tall, narrow masses of the towers. Nor can any remedy be suggested which does not require a complete overthrow of the conditions.

As for the details of the composition, they are as defective as gleanings from two different styles, patched together by a designer of cold and petty sensibilities, might be expected to be. The general motive of the detail is the round arch, and the circular plan of the pinnacles is rather a happy treatment in connection with them. To complete it, however, it should have been carried into the spires themselves, the present octagonal plan being without the necessary similarity.

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